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The Allied Health Professions Personnel Training Act of 1966 as amended by Title III of the Health Manpower Act of 1968 requires the Secretary of Health, Education, and Welfare to submit a report on the administration of the act, an appraisal of programs in terms of their adequacy to meet needs, and recommendations for the future. This document is that report. Sources of information include: the Department of Health, Education, and Welfare, other federal agencies, professional associations, and educational institutions. Deliberations of the National Advisory Allied Health Professions Council are also reflected. The major chapters treat: (1) the provisions and implementation of the Act and the accomplishments of grant programs, (2) allied health manpower supply and requirements in the medical, dental, and environmental health areas, and (3) allied health manpower education and training needs. A general conclusion is the need to bring together the many skills essential to the maintenance of health in an effective manner, and the dependence of this effectiveness upon quality education and training. Particular attention is called to the development of a broad range of allied health occupations. The major recommendation is for a 1-year extension of the Act. (JK)

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VT009581

Report to the President and the Congress

THE ALLIED HEALTH PROFESSIONS PERSONNEL TRAINING ACT OF 1966 AS AMENDED

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service—National Institutes of Health
Bureau of Health Professions Education and Manpower Training
Division of Allied Health Manpower
Bethesda, Md. 20014

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ERRATA

Report to the President and the Congress
The Allied Health Professions Personnel Training Act of 1966, as amended

Page 7. Authorizations and Appropriations.

Substitute for 3rd sentence: The authorization for fiscal year 1970 is $39.5 million.

Substitute for Table 1.:

Table 1. Authorizations and Appropriations for Allied Health Professions Grants Programs: 1967 through 1970

Fiscal years	Total grant program	Construction grants	Educational improvement grants	Advanced training grants	Development of new methods grants
1967					
Authorization	$14,250,000	$3,000,000	$9,000,000	$1,500,000	$750,000
Appropriation	3,735,000	....	3,285,000	250,000	200,000
1968					
Authorization	26,750,000	9,000,000	13,000,000	2,500,000	2,250,000
Appropriation	15,250,000	[1] 3,000,000	9,750,000	[2] 1,500,000	[3] 1,000,000
1969					
Authorization	37,000,000	13,500,000	17,000,000	3,500,000	3,000,000
Appropriation	14,325,000	1,800,000	9,750,000	1,550,000	1,225,000
1970					
Authorization	39,500,000	10,000,000	20,000,000	5,000,000	4,500,000
Budget request as of January 1969	12,538,000	....	9,750,000	1,550,000	1,238,000

[1] $1,000,000 was placed in reserve and carried over to 1969. This reduced the money available for construction grants in fiscal year 1968 to $2,000,000 and increased the amount available in fiscal year 1969 to $2,800,000.

[2] Reserves necessitated by the cost reduction program reduced the funds available for obligation to $1,204,000.

[3] Reserves necessitated by the cost reduction program reduced the funds available for obligation to $800,000.

Division of Allied Health Manpower, Bureau of Health
Professions Education and Manpower Training, NIH, PHS,
Department of Health, Education, and Welfare

THE SECRETARY OF HEALTH, EDUCATION, AND WELFARE
WASHINGTON, D.C. 20201

April 29, 1969

To the Congress of the United States:

In accordance with the requirements of section 301(d) of the Health Manpower Act of 1968 (Public Law 90-490), I am herewith respectfully transmitting to you, and to the President, a report on the administration of the Allied Health Professions Personnel Training Act of 1966 (Public Law 89-751) and my recommendations on the needs in this field of manpower.

Sincerely,

Robert H. Finch

Secretary

The Speaker of the House of Representatives
The President of the Senate
The Capitol
Washington, D.C.

Preface

The Allied Health Professions Personnel Training Act of 1966 was amended by Title III of the Health Manpower Act of 1968. The Act, as amended, requires that a report on the administration of the Act, an appraisal of the programs thereunder in the light of their adequacy to meet the needs for allied health professions personnel and recommendations as a result thereof, be submitted by the Secretary to the President and the Congress. This document is the report prepared to meet that statutory requirement. It has been developed in the Division of Allied Health Manpower, Bureau of Health Professions Education and Manpower Training, National Institutes of Health, the operating unit within the Department of Health, Education, and Welfare, which is responsible for the implementation of the programs authorized by the Act.

In preparing this report, material available within the office administering this legislation has been augmented by information obtained from professional associations, educational institutions, the regional offices, and other components of the Department of Health, Education, and Welfare, and other Federal agencies. The report also reflects deliberations of the National Advisory Allied Health Professions Council. The information thus provided was particularly valuable in developing a broad frame of reference for allied health manpower needs within which the programs authorized under the Act were examined and evaluated.

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Summary and Recommendation

The great advances in prevention, diagnosis, therapy, and rehabilitation developed through research in the past two decades; improvements in education and understanding by the public of health care; increasing awareness of the availability of health services; shifts in the size, age composition, and distribution of the population; and a growing conviction that adequate health care is a right have heightened the disparity between the demand for health services and their timely availability to individuals and the community.

Recent legislation designed to improve health services including the Hospital and Medical Facilities Amendments of 1964 (Public Law 88–443), Titles 18 and 19 of the Social Security Amendments of 1965 (Public Law 89–97), the Heart Disease, Cancer, and Stroke Amendments of 1965 (Public Law 89–239), the Comprehensive Health Planning and Public Health Service Amendments of 1966 (Public Law 89–749) has had a major influence on the demand for health personnel. In response to recognized needs, legislation has also been passed within the last decade which has been directed specifically toward increasing the supply and the quality of health personnel. The most important have been the Health Professions Educational Assistance Act of 1963 (Public Law 88–129), the Nurse Training Act of 1964 (Public Law 88–581), the Health Professions Educational Assistance Act Amendments of 1965 (Public Law 89–290), the Allied Health Professions Personnel Training Act of 1966 (Public Law 89–751), and the Health Manpower Act of 1968 (Public Law 90–490).

The increasing complexity of social problems and the necessity for confronting such technological problems as the contamination of our environment, together with the potential benefits to be derived from the application of advances in science and technology to such problems, have greatly increased the demand for individuals skilled in the health professions and technologies to provide the array of services which are now possible. Demands and expectations for health services that must be provided by professional and technical workers in the field of personal and environmental health services exceed the supply and the present capacities of the educational and other institutions which prepare them.

The many types of skills required to provide the potential range of services essential to the maintenance of health, the prevention of illness, and the care and therapy required by those who have become ill must be brought together in such a way that they are effective and efficient. However, effectiveness and efficiency in the provision of health services ultimately depend on the quality of education and training, as well as the numbers and distribution, of the people who render such services.

The more clearly recognized and longer established health professions of medicine, dentistry, and nursing have received serious attention for a number of years. However, only recently has the broad range of other professional and technical functions essential to all types of health services been recognized for its significance and attracted the attention of educators, practitioners, managers of health services, and the consumers of health services. This group of occupations, so essential for the expansion and quality of health services, has been designated as the "allied" health occupations. It includes an extensive range of endeavors for which special training or education is required.

The allied health professions and occupations categories and functions are undergoing rapid changes and are presently not well defined. Students in the allied health professions and occupations are prepared in a wide variety of settings. There is a paucity of information about the numbers of people serving in these professions, their distribution, their education and training, the ways in which their skills are used, and the directions that should be taken for better utilization of their skills in the variety of personal and community health services settings which exist or are contemplated for the future. In environmental health services, available information is even more rudimentary. Nonetheless, the experience gained during the initial 2 years of the implementation of the Allied Health Professions Personnel Training Act of 1966 has provided significant information about the education and training of allied health personnel and information which is important for future planning.

There has been increasing awareness of the necessity to develop linkages among academic, training, and service institutions and the various related professional groups so that dynamic educational programs can be offered that will attract able students and prepare them for satisfying careers. The development of schools of the allied health professions within universities and the concurrent developing interrelationships between these schools and schools of medicine and dentistry are examples. The Act has increased the awareness of institutions about the need to expand educational and training efforts, of communities to assess their needs for health workers and in turn to develop programs in community colleges and other institutions of higher education, and of those institutions providing health services to create opportunities for education and training of people who wish to enter the health field.

The Act has also made evident the necessity for students to acquire backgrounds which will enable them to develop their careers in the allied health field and has substantiated the need to provide opportunities for further education and training for those already engaged in allied health careers. Specifically, the Allied Health Professions Personnel Training Act of 1966 has been effective in providing a focus for the allied health professions. It has enabled junior colleges, colleges, and universities with established training programs in the eligible allied health professions to acquire additional needed faculty and equipment to improve the quality of the programs offered. It has provided opportunities for a limited number of allied health personnel to prepare for positions as teachers, supervisors, administrators, and specialists in their disciplines. It has stimulated innovative thinking in the areas of curriculum development, teaching methods, and the development of new types of health personnel to fill unmet needs.

This report deals with the brief experience that has been gained under the Allied Health Professions Personnel Training Act of 1966, as amended. The resources available to accomplish the purposes of the Act have been extremely limited; and experience with the program has been confined primarily to the categories of personnel engaged in personal health services. The decision was made to concentrate the limited Federal resources available initially on personnel for personal health services on account of the overwhelming demands. Also, shortages could be more clearly identified, particularly in institutional settings, than could specific personnel needs for environmental health services, for example; although shortages in the latter area were clearly recognized.

The implementation of the Act has revealed: the lack of information and data about allied health personnel—employment, requirements, necessary education and training; the need to study and experiment in the areas of education and manpower utilization; and the need to develop plans at the local or community level to assess allied health manpower requirements and develop specific programs to meet those requirements. The experience has also given rise to concern about the implications and long-term effects of the current emphasis on support of allied health educational programs by means of the formula grant mechanism. The lack of flexibility imposed by this mechanism in a field that is still developing, and not yet well defined, can seriously hinder its future development.

The experience and the effort to date represent a modest beginning in dealing with a complex and important aspect of the provision of health services for all who need them.

Recommendation

To enable the new Administration to have time to develop a consolidated program and to make the Allied Health Professions Personnel Training Act coterminous with other health manpower legislation which is due for renewal next year, the Department recommends:

The Allied Health Professions Personnel Training Act of 1966, as amended, be extended for 1 year, thereby made coterminous with other Acts pertaining to the nursing and health professions manpower programs.

Chapter I

Introduction

The enactment and subsequent implementation of the Allied Health Professions Personnel Training Act of 1966 focused national attention on a vast pool of health manpower, which provides a multitude of services associated with the health of people. Administrative responsibility for implementation of the Allied Health Professions Personnel Training Act of 1966 was placed in the Bureau of Health Manpower of the Public Health Service.[1] This report pertains to that legislation and its implementation. It does not include analysis of allied health manpower activities of other Federal agencies.

For purposes of this report, the term "allied health" manpower, when used broadly, covers all those professional, technical, and supportive workers in the fields of patient care, community health, public health, environmental health, and related health research who engage in activities that support, complement, or supplement the professional functions of administrators and practitioners. Occupational categories in which personnel require only nominal orientation to become fully productive in the health industry are not included.

There are more than 100 professional, technical, or vocational specialties which can be identified as components of the general, broad allied health manpower concept. Most of them require some formal post high school education. However, the preparation for employment varies from on-the-job training to a few occupations that require formal education at the master and doctoral levels.

The level of education required for employment is influencing the designations attached to job titles. Increasingly, those people trained in formal education programs that include theoretical and practical courses usually leading to a certificate or the associate degree are considered "technicians"; and those who are required to have at least a baccalaureate degree are referred to as "technologists."

Changes Affecting the Demand for Allied Health Manpower

The accelerating needs for health manpower to provide personal health care and environmental health services has been attested by national studies, task forces, Congressional hearings, and such groups of experts as the participants in the White House Conference on Health, the Third National Conference on Public Health Training, and the President's National Advisory Commission on Health Manpower. The Allied Health Professions Education Subcommittee of the National Advisory Health Council focused specific attention on the problems of meeting needs for allied health professions and services. In its report, "Education for the Allied Health Professions and Services," the following observation is made:

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[1] The Bureau of Health Manpower was established as one of five bureaus of the Public Health Service on Jan. 1, 1967, to provide a central focus for health manpower activities. It was incorporated into the National Institutes of Health agency on Apr. 1, 1968. On Dec. 26, 1968, Secretary Cohen approved a change in title to the Bureau of Health Professions Education and Manpower Training.

> *Needs in medicine, dentistry, and nursing have received major attention for a number of years, and fairly well-defined goals for eduactional progress and expansion have been established. But with a few exceptions relatively little attention has been given to the needs and the educational potential for the many allied health occupations which are essential to modern health services.*
>
> *There are now major unmet needs for health manpower. Indeed, the lack of adequate health manpower is a most serious problem as we aspire to bring the full potential of modern medicine to all members of our society.*[2]

Socioeconomic Influences

The urgency for a significant increase in the number of qualified personnel to provide health care and environmental services can be attributed to four principal social and economic forces.

- ***Rapid growth of the population and the changes in its demographic characteristics***

Progress in the control of communicable disease has extended life expectancy and increased the proportion of older people. Consequently, there exists a substantial increase in the need for more complex health care services. The proliferation of metropolitan areas has been a concurrent feature to the Nation's population growth. It is requiring changes in patterns of the delivery of health services and intensified attention to the prevention and control of environmental hazards.[3]

- ***Development of knowledge in the health sciences and technologies***

The knowledge, skills, techniques, and equipment related to the preservation, repair, and enhancement of the health of man have burgeoned at a rapid rate. Scientific developments in the basic and clinical sciences have made medicine a highly skilled practice in the application of scientific principles and procedures. The pattern of health care has progressed since the turn of the century from service provided by the physician and nurse to a complex system in which more than 100 occupational categories are involved. Their development has been accelerated by the use of new drugs, new diagnostic and therapeutic devices of increasing complexity, changes in techniques, and many other means that prevent plague and pestilence, enhance life expectancy, speed recovery from disease and disability, and offer the potential for man to enjoy an improved state of health and well-being.

- ***Changes in sources and methods of payment for health care***

Our citizens have grown accustomed to the premise of public responsibility for welfare and social security systems and to prepayment and insurance systems to ease the burden of medical expense. The shared-risk approach to easing the hazard of medical care costs of the aged as a concomitant to social security has outpaced the readiness of our health care systems to take on the additional load.

- ***Changes in social values***

Health has acquired special significance in our society. The public increasingly supports demands for a health care system which will be responsive to the health care needs of the total populace.

Changes in Allied Health Manpower Education—New Directions

Training for most of the allied health occupations was initially provided on the job in patient care facilities. Requirements of this training were established in terms of clock hours of supervised experience in the performance of certain tasks. Training with high standards for both the academic and practicum portions have been more recent developments.

Hospitals were the sites of the early development of the allied health occupations and continue to be a principal source of allied health manpower. Formal eduaction in an educational institution, however, increasingly has become the pattern for the preparation of allied health workers. This is a particularly significant development, not only because an ever-increasing number of young people choose to continue their education beyond high school, but also because a more formal educational setting prepares people to adapt more readily to rapid changes in technology and practice. The hospital, the clinic, and other health care institutions are essential elements in the education of all people in the health professions and occupations because clinical experience is an integral part of such education. However, the opportunities provided by junior and senior colleges and universities are important to the development of well-trained allied health workers. Programs in these institutions also increase the possibilities of substantially increasing the numbers of people prepared in the allied health occupations.

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[2] *Education for the Allied Health Professions and Services,* U.S. Department of Health, Education, and Welfare; Public Health Service, 1967, p. 3.

[3] See app. B.

The emergence of the junior and community college as a major educational resource has been particularly important for the education and training of allied health personnel. Associate-degree curriculums for many allied health occupations are being offered by these institutions in affiliation with hospitals and other health care facilities. The special role that many junior and community colleges play in preparing manpower to meet local needs has given impetus to this development.

Education for technologists in certain allied health occupations has been offered in 4-year colleges for some time. Frequently, these colleges have offered a single allied health curriculum; some have offered curriculums in several fields. The practicum has been provided in health care institutions, usually in hospitals, with which the 4-year college has established an affiliation and in which the college assumes responsibility for the educational program for its students.

More recently, schools of allied health professions have developed to provide baccalaureate and more advanced education in the allied health occupations. These schools offer several allied health professions curriculums and are parts of universities. Although St. Louis University established its School of Nursing and Health Services in 1929 and offered programs in several allied health disciplines, it was not until 1950 that a second university, the University of Pennsylvania, established a School of Allied Medical Professions. In 1957, the University of Florida established an allied health professions school; and Indiana University followed in 1958. The recognition of increasing needs for allied health workers and the rising demand for health services were factors in the development of at least nine other allied health professions schools in 1963 and 1964. An added impetus was given by the enactment of the Allied Health Professions Personnel Training Act in 1966. Today, about 50 institutions have similar programs at various stages of development.

The patterns of organization among these schools vary considerably. For example, they are located in both colleges and universities; some are separate schools within universities and are administered by a dean; some are divisions within medical schools and are administered by a director who is responsible to the dean of the school of medicine; some offer a wide range of allied health professions programs; and others offer only a few. Some junior colleges are developing similar patterns of organization. Estimates have been made that, by 1970, perhaps 60 such schools may be in operation. This surge of interest and activity in the education for allied health occupations resulted in the establishment of the Association of Schools of Allied Health Professions in September 1967. The Association's objective is to provide a focus and a forum for the development and improvement of allied health professions education.

Legislation for the Development and Education of Allied Health Manpower

The Health Professions Educational Assistance Act of 1963 and the Nurse Training Act of 1964 authorized Federal support for the education of physicians, dentists, pharmacists, podiatrists, optometrists, veterinarians, and professional nurses. The experience under these programs spurred greater recognition of the changing patterns of health services and the imbalance between health manpower supply and demands.

President Johnson, in his Health Message to Congress, January 1965, focused on this issue when he stated, in part:

> We must look to the future in planning to meet the health manpower requirements of the Nation * * * If we are to meet our future needs and raise the health of the Nation, we must * * *
>
> 1. Improve utilization of available professional health personnel * * *

2. Expand the use and training of technicians and ancillary health workers * * *
3. Expand and improve training programs for professional and for supporting health personnel * * *
4. Plan ahead to meet requirements for which the lead time is often 10 years or more * * *

The 89th Congress, responding to the President's charge, enacted the Allied Health Professions Personnel Training Act of 1966. The Act was signed into law (Public Law 89–751) by President Johnson on November 3, 1966.

This was the first legislation specifically designed to increase the number of allied health personnel and to improve and expand allied health education and training. Title III of the Health Manpower Act of 1968 (Public Law 90–490) extended the Allied Health Professions Personnel Training Act of 1966 for 1 year, through fiscal year 1970, with minor modifications in its provisions.

Chapter II

The Allied Health Professions Personnel Training Act of 1966

The Allied Health Professions Personnel Training Act of 1966[1] was enacted in recognition of the increasing importance of professional and technical health personnel in the provision of health services. The 89th Congress identified the education of personnel in the allied health professions and technical occupations as essential elements in the provision of health services and recognized that a significant national effort was required to improve programs of training and to increase the numbers who could provide essential health services.

The Congress also recognized that, while accurate assessment of the needs for allied health manpower either in size or in composition was not possible, shortages of health manpower to staff hospitals, nursing homes, and home health services, for example, were real and critical. The Allied Health Professions Personnel Training Act of 1966 was intended to help meet allied health manpower needs by increasing the opportunities for preparation in the allied health professions and by increasing the quality of training in junior colleges, colleges, and universities.

Provisions of the Act

The Allied Health Professions Personnel Training Act of 1966,[2] which was approved on November 3, 1966 (Public Law 89–751), authorized four types of grants in aid to "training centers for allied health professions."

"Training center for allied health professions" was defined in the Act[3] to mean a junior college, college, or university—

(*a*) providing programs of education leading to an associate degree, a baccalaureate degree, or a higher degree in medical technology, optometric technology, dental hygiene, or any other allied health professions curriculums specified in regulations by the Secretary and, if in a junior college, a program acceptable for full credit toward a baccalaureate degree in the allied health professions, or designed to prepare the student to work as a technician in a health occupation specified in regulations by the Secretary;

(*b*) providing training for no fewer than a total of 20 persons in such curriculums;

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[1] Public Law 89–751 approved Nov. 3, 1966. The law added a new pt. G to Title VII of the Public Health Service Act. For the text of the new pt. G, see app. A.

[2] For the full text of the Allied Health Professions Personnel Training Act of 1966 and its subsequent amendments, see app. A.

[3] Sec. 795 of the Public Health Service Act.

(*c*) having as one of its components, or affiliated with, a teaching hospital which provides the clinical component of the training program; and

(*d*) accredited by a recognized body or bodies approved for such purpose by the Commissioner of Education. (In the case of a junior college, the statute itself recognizes accreditation by the regional accrediting agency for the region in which it is located.)

The four types of financial assistance to such training centers authorized under the Act were as follows:

1. ***Construction of teaching facilities.***[4] Construction grants for new or expanded teaching facilities for training centers and affiliated hospitals were authorized with the Federal share in the costs of construction not to exceed 66⅔ percent. Projects for renovation or rehabilitation of teaching facilities not involving major expansion could be assisted with a Federal share not to exceed 50 percent.

2. ***Improvement of the quality of training centers.***[5] The Act authorized two types of grants to training centers for the expansion and improvement of allied health curriculums: *Basic Improvement Grants* to be awarded on a formula of $5,000 times the number of eligible curriculums in which the center provides training plus $500 times the number of full-time students receiving training in such curriculums, and *Special Improvement Grants,* to be awarded on a project basis to centers providing, or which with the aid of the grant will provide, no fewer than three of the eligible curriculums. No Special Improvement Grant to any center may exceed $100,000 for any fiscal year.

3. ***Traineeships for advanced training of allied health professions personnel.***[6] Grants are made to allied health training centers to cover the cost of traineeships for allied health professions personnel to become teachers, administrators, supervisors, or to serve in allied health specialties. The allied health centers make the traineeship awards to students who have completed basic professional training required for employment in one of the eligible allied health disciplines.

4. ***Development of new methods.***[7] The original Allied Health Professions Personnel Training Act of 1966 authorized grants (hereafter referred to as "Developmental" grants or "New Methods" grants) to allied health training centers for projects to develop, demonstrate, or evaluate curriculums for the training of new types of health technologists.

Amendments to the Act

The first amendment was included in the Partnership for Health Amendments of 1967 (Public Law 90–174), approved December 5, 1967. Section 12(e) of that Act[8] deleted the term "medical technology" from the disciplines named in the statute as eligible for support at the associate degree level. This was a technical amendment designed to eliminate confusion in occupational titles, inasmuch as "medical technology" is a term most generally associated with baccalaureate level programs. The Secretary, pursuant to his authority to specify in regulations disciplines to be eligible under the Allied Health law, substituted the term "medical laboratory technician" for "medical technology"; and support of such associate degree programs continued without interruption.

The second amendment was made by Title III of the Health Manpower Act of 1968 (Public Law 90–490).[9] This amendment extended for 1 year—through fiscal year 1970—the original Allied Health law which would have expired June 30, 1969. It also made several changes in the authority for the Developmental Grants. The original Allied Health Professions Personnel Training Act of 1966 authorized Developmental Grants to allied health training centers for projects to develop, demonstrate, or evaluate curriculums for the training of new types of health technologists.

Section 301(b) of the Health Manpower Act broadened the eligibility provisions to authorize grants to public or nonprofit agencies, institutions, and organizations as well as training centers. The same section deleted the phrase "new types" as it related to health technologists and added the phrase "and methods" to make it clear that projects to develop, demonstrate, or evaluate educational methods as well as curriculums may be supported and that projects may be directed toward known as well as new types of health technologists.

Section 301(c) added a new Section 797 to the Public

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[4] Sec. 791 of the Public Health Service Act.

[5] Sec. 792 of the Public Health Service Act.

[6] Sec. 793 of the Public Health Service Act.

[7] Sec. 794 of the Public Health Service Act.

[8] For the text of Sec. 12(e) of Public Law 90–174, see app. A.

[9] For the text of the allied health provisions of Title III, Health Manpower Act of 1968, see app. A.

Health Service Act to provide that, beginning in fiscal year 1970, funds not to exceed one-half of 1 percent of the appropriations under the Allied Health Professions Personnel Training Act be available to the Secretary for evaluation, directly or by grants or contracts, of the programs under the Act.

Section 301(d) of the Health Manpower Act added a new Section 798 to the Public Health Service Act, requiring the Secretary of Health, Education, and Welfare to prepare and submit to the President and the Congress a report on the administration of the Allied Health law, an appraisal of the programs thereunder in light of their adequacy to meet the needs for allied health personnel. It was in response to this statutory directive that this report was prepared.

Authorizations and Appropriations

The total authorization for fiscal years 1967 through 1969 was $78 million. The total appropriation for that period was $33,310,000. The authorization for fiscal year 1970 is $46½ million. The fiscal year 1970 budget, as of January 1969, requests $12,538,000. Authorizations and appropriations for each year are shown in table 1.

Implementation of the Act

Immediately upon the enactment of the law, the Surgeon General of the Public Health Service appointed a task force to develop regulations and guidelines to implement the Act. The first task was to determine the programs and disciplines that would be eligible to apply for funds provided under the authorities of the Act. In making the selection of the programs and disciplines it was recognized that the demands for personal health services were increasing rapidly and that the shortages of allied health personnel were more clearly documented in those allied health occupations most directly related to patient care. It was also evident that data about most of the allied health professions and occupations were most inadequate. Wide variations were known to exist in the allied health education and training programs, and only limited funds were available for the initial implementation of the Act. The task force, therefore, recommended that priority for assistance be given to those allied health occupations most directly related to patient care and those for which shortages were most fully documented.

On January 3, 1967, the Secretary issued regulations designating the disciplines eligible under the law. These

Table 1. Authorizations and Appropriations for Allied Health Professions Grants Programs: 1967 through 1970

Fiscal years	Total grant program	Construction grants	Educational improvement grants	Advanced training grants	Development of new methods grants
1967					
Authorization	$14,250,000	$3,000,000	$9,000,000	$1,500,000	$750,000
Appropriation	3,735,000	....	3,285,000	250,000	200,000
1968					
Authorization	26,750,000	9,000,000	13,000,000	2,500,000	2,250,000
Appropriation	15,250,000	[1] 3,000,000	9,750,000	[2] 1,500,000	[3] 1,000,000
1969					
Authorization	37,000,000	13,500,000	17,000,000	3,500,000	3,000,000
Appropriation	14,325,000	1,800,000	9,750,000	1,550,000	1,225,000
1970					
Authorization	46,500,000	20,000,000	17,000,000	5,000,000	4,500,000
Budget request as of January 1969	12,538,000	....	9,750,000	1,550,000	1,238,000

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[1] $1,000,000 was placed in reserve and carried over to 1969. This reduced the money available for construction grants in fiscal year 1968 to $2,000,000 and increased the amount available in fiscal year 1969 to $2,800,000.

[2] Reserves necessitated by the cost reduction program reduced the funds available for obligation to $1,204,000.

[3] Reserves necessitated by the cost reduction program reduced the funds available for obligation to $800,000.

included the three disciplines specified in Section 795 of the Act; i.e., medical technology, optometric technology, dental hygiene, and others as follows; radiologic technologist, medical records librarian, dietitian, occupational therapist, physical therapist, X-ray technician, medical records technician, inhalation therapy technician, dental laboratory technician, dental assistant, ophthalmic assistant, occupational therapy technician, and food service assistant. In addition, the regulations require that there be no less than six students in any single eligible curriculum. Students who may be counted by the institution are those enrolled in the third and fourth years of an eligible baccalaureate program, plus those enrolled in related postbaccalaureate clinical training, and those students enrolled in the second or final year of an eligible associate degree program.

The Basic Improvement Grant regulations were amended on November 6, 1968, to add "sanitarian" and "sanitarian technician" to the eligible curriculums.[10] On December 27, 1968, the regulations were modified to clarify certain occupational titles and to implement the technical amendment in Section 12(e) of Public Law 90–174 which deleted the term "medical technology" at the associate degree level by substituting the more appropriate terminology, "medical laboratory technician." The disciplines as currently listed are:

- Baccalaureate or its equivalent:
  - Dental hygienist
  - Dietitian
  - Medical record librarian
  - Medical technologist
  - Occupational therapist
  - Optometric technologist
  - Physical therapist
  - Radiologic technologist
  - Sanitarian
- Associate degree or its equivalent:
  - Dental assistant
  - Dental hygienist
  - Dental laboratory technician
  - Dietary technician
  - Inhalation therapy technician
  - Medical laboratory technician
  - Medical record technician
  - Occupational therapy assistant
  - Ophthalmic assistant
  - Optometric technologist
  - Sanitarian technician
  - X-ray technician

Grant Programs Accomplishments

Construction Grants

Fiscal year 1968 was the first year for which construction grant appropriations were made.

An initial appropriation of $3 million for implementation of the construction authority was made in fiscal year 1968. Of the total appropriation, $1 million was placed in reserve to be carried over for use in fiscal year 1969. This left a balance of $2 million for allied health construction in fiscal year 1968. For fiscal year 1969, a total of $1,800,000 was appropriated by the Congress, which, when added to the $1 million carried over from the 1968 appropriation, provides a total of $2,800,000 for allied health construction in fiscal year 1969.

The limited funds available for construction grants have permitted awards, as of February 1, 1969, totaling $3,522,932 for three projects. These three projects will provide new spaces for 541 students. Unfunded applications and letters of intent on hand as of February 1, 1969, total nearly $12 million. A summary of the three allied health construction grants funded as of February 1, 1969, is given in table 2.

Educational Improvement Grants

BASIC IMPROVEMENT GRANTS are formula grants to junior colleges, colleges, and universities to increase the opportunities for training and to improve the educational programs that prepare students in medical technology, optometric technology, dental hygiene, and the other allied health professions designated by the Secretary as eligible for support. These educational institutions may offer training leading to the associate degree, the baccalaureate, or their equivalents, or a higher degree. Grants are awarded on the basis of $5,000 for each eligible curriculum plus $500 for each eligible student.

Two grant cycles for the Basic Improvement Grant program have been completed. The first Basic Im-

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[10] In compliance with the directive contained in H. Rept. No. 1634, Health Manpower Act of 1968, p. 6.

Table 2. Construction Grants: Awards as of February 1, 1969

Item	Ohio State University	New Hampshire Institute of Technology	University of Vermont
Fiscal year grant funded	1968	1969	1969.
Cost of construction	$4,000,000	$891,487	$3,506,135.
Federal share	$1,791,920	$194,373	$1,536,639.
New spaces	337	38	166.
Enrollment in eligible curriculums:			
Current	246		37.
Estimated first year after construction	583	38	203.
Eligible curriculums currently offered	Medical dietetics Medical technology Occupational therapy Physical therapy		Dental hygiene. Medical technology. Radiologic technology.
Additional eligible curriculums to be offered after completion of construction	Inhalation therapy Medical record librarian Radiologic technologist	Dental hygiene X-ray technician	Physical therapy.

provement Grants were awarded in fiscal year 1967 to 164 colleges and universities and to 28 junior colleges. These institutions offered a combined total of 395 programs in 17 disciplines and had a total eligible enrollment of 12,282 students as of October 15, 1966, to which the formula was applied. Approved applications, computed by the statutory formula for this program totaled $8,081,000. Available funds for these awards totaled $3,285,000. The pro rata share for each institution awarded a grant was 40.6 percent of the formula amount to which the schools were entitled.

The second group of Basic Improvement Grants was awarded in fiscal year 1968 to 197 colleges and universities and to 33 junior colleges that offered a combined total of 482 programs in 17 disciplines and had a total eligible enrollment of 15,665 as of October 15, 1967, to which the formula was applied. Approved applications, computed by the statutory formula for this program totaled $10,207,500. Available funds for these awards totaled $9,750,000. This represented 95.7 percent of the formula amount to which the schools were entitled.

A summary of Basic Improvement Grants for fiscal years 1967 and 1968 follows.

Basic improvement grants	Fiscal year 1967	Fiscal year 1968
All institutions	192	230
4-year institutions	164	197
2-year institutions	28	33
Programs	388	475
Eligible enrollment	12, 282	15, 665
Awards	[1] $3, 285, 000	[2] $9, 750, 000

[1] Funded at 40.6 percent of the statutory formula.
[2] Funded at 95.7 percent of the statutory formula.

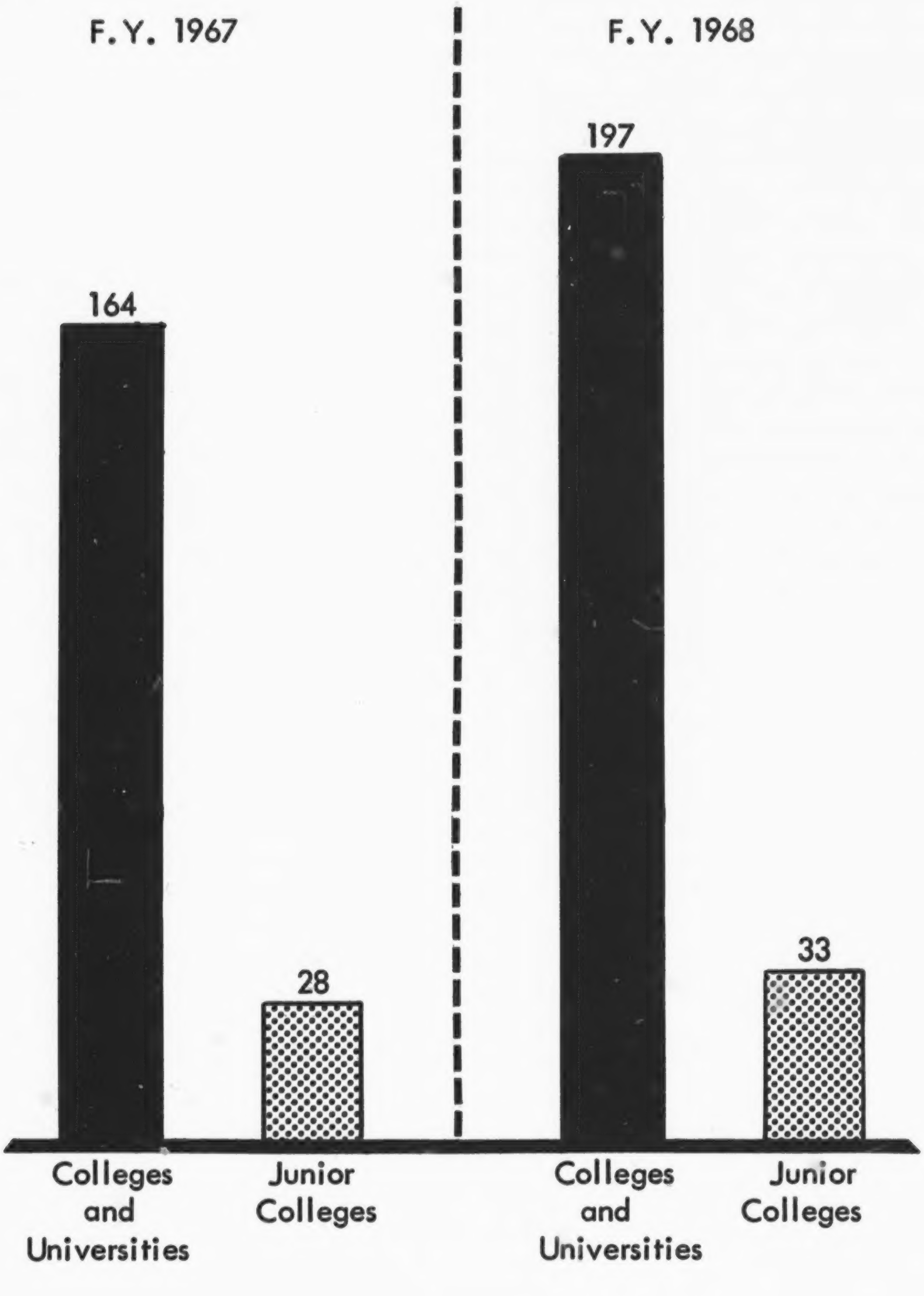
The application deadline for the fiscal year 1969 Basic Improvement Grants was December 1, 1968. More than 280 applications have been received for this award period. Awards will be made in April 1969. The number of schools eligible for Basic Improvement Grants has increased. Additional disciplines have been added to those already eligible, and more students are in programs eligible to receive grants. It is estimated that the $9,750,000 appropriated for fiscal year 1969 will fulfill approximately 60 percent of each institutional entitlement. Due to these changes, following the Health Manpower Amendments of 1968, the figures for Basic Improvement Grants applications to be awarded in fiscal year 1969 are not comparable with those in fiscal year 1967 or fiscal year 1968.

Types of Institutions Supported

In fiscal year 1967, 192 institutions received Basic Improvement Grants. Of these, 164 (85 percent) were 4-year colleges and universities, and 28 (15 percent) were 2-year junior or community colleges. In fiscal year 1968, 197 (86 percent) 4-year institutions and 33 (14 percent) 2-year colleges received grants (see fig. 1). The amounts of funds awarded reflect approximately the same institutional distribution. Colleges and universities received $10,354,000 or 79 percent of the total $13,035,000 awarded in the 2 fiscal years.

Several factors account for the difference in numbers of awards to 4-year institutions and to junior or community colleges. First, there are approximately 1,500 4-year institutions in the Nation, but only 1,100 junior

Figure 1. BASIC IMPROVEMENT GRANTS
Institutions Awarded Grants



or community colleges. Second, the 4-year institutions as a group have larger enrollments. Third, health occupations curriculums have been established in 4-year colleges for some time, but are a relatively new development in junior colleges. It can be expected that, as more allied health curriculums are established in junior or community colleges and as enrollments grow, the number of such institutions eligible for grants under the Act will increase.

Geographic Distribution of Programs Supported

In every State except Alaska and Nevada, at least one institution has received a grant award. No awards have been made to institutions in the District of Columbia, Guam, or the Virgin Islands. In fiscal year 1967, there were 15 States in each of which 10 or more programs received support. California had 51 programs; New York, 31. In fiscal year 1968, 16 States received support for 10 or more eligible allied health training programs. California and New York were again first and second with 61 and 44 eligible programs supported, respectively. A summary of the distribution of Basic Improvement Grants, the number of programs supported, and the total amounts of awards is set forth in table 3.

Enrollment in Institutions Supported

The time span has been too short to determine the extent of the stimulatory effect that the Basic Improvement Grants program under the amended Allied Health Professions Personnel Training Act of 1966 has had on the rate of enrollment increase in grantee institutions.

The 1967–1969 projected rate of enrollment increase, as reported by the schools, is significantly greater than the trend for the years prior to 1966. Enrollment in the programs eligible for support at institutions which received Basic Improvement Grants in fiscal year 1967 increased from 7,775 in 1961 to 9,993 in 1963. In 1965, it rose to 11,767, and 15,665 in 1967. The eligible enrollment in these grantee institutions is expected to exceed 19,000 by the fall of 1949. The anticipated enrollment in 1969 represents an increase of more than 60 percent since 1965 (table 4).

These data indicate the impressive efforts of educational institutions to increase their enrollments in order to meet the increased demand for trained allied health professions personnel.

Number and Types of Curriculums Supported

The total number of eligible programs offered in institutions receiving Basic Improvement Grants increased from 388 in fiscal year 1967 to 475 in fiscal year 1968. The average of two eligible curriculums per institution in 1967 increased to slightly more than two in 1968. This was an increase of 98 programs, or 26 percent, from the number of programs reported for 1961 at the institutions that received Basic Improvement Grants in 1968. Since 1965 there has been a 5-percent increase; i.e., 24 additional programs. The institutions offering baccalaureate programs constituted 85 percent of the curriculums eligible for support in fiscal year 1967. The number of curriculums offered per school was greater among the associate degree-granting institutions which averaged nearly four eligible curriculums per school (table 4).

The greatest number of eligible programs and the largest enrollments at grantee institutions were for baccalaureate level medical technology programs. In fiscal year 1968, awards were made for 166 medical technology programs with a total eligible enrollment of more than 5,600 students. At the associate degree level, the dental hygiene programs represented the largest number of programs with a total eligible enrollment of 1,176 students (table 4). In fiscal year 1968, among the baccalaureate programs, medical technology received $3,516,741 in Basic Improvement Grants. This was more than twice the amount received by any other baccalaureate discipline. At the associate degree level, dental hygiene received the greatest amount, $708,419. This was approximately twice the amount received by any other associate degree discipline (table 5).

Table 3. Basic Improvement Grants: Institutions, Programs, and Awards by State: 1967 and 1968

State or territory[1]	Fiscal year 1967			Fiscal year 1968		
	Institutions	Programs	Awards	Institutions	Programs	Awards
Total	192	388	$3, 285, 000	230	475	$9, 750, 000
Alabama	3	5	43, 487	4	8	142, 066
Arizona	2	5	40, 436	2	5	104, 756
Arkansas	2	3	25, 808	3	4	77, 969
California	24	51	458, 226	28	61	1, 323, 116
Colorado	2	5	53, 849	2	5	166, 462
Connecticut	3	5	62, 181	3	5	178, 420
Delaware	1	1	7, 315	1	1	16, 742
Florida	5	9	73, 966	5	9	190, 857
Georgia	2	3	22, 149	3	5	73, 665
Hawaii	1	3	23, 775	1	3	59, 314
Idaho	3	5	23, 775	3	5	64, 097
Illinois	6	12	79, 860	7	13	221, 949
Indiana	4	11	85, 549	4	12	269, 782
Iowa	4	8	65, 229	4	8	171, 245
Kansas	3	8	68, 073	3	7	174, 594
Kentucky	3	6	32, 714	4	10	134, 892
Louisiana	8	12	84, 534	7	13	231, 037
Maine	2	4	19, 914	2	4	55, 966
Maryland	2	3	19, 305	2	4	56, 444
Massachusetts	5	10	114, 609	5	10	297, 526
Michigan	9	26	229, 011	11	31	656, 759
Minnesota	4	14	112, 575	6	17	355, 883
Mississippi	4	6	36, 780	4	7	102, 365
Missouri	3	10	72, 748	3	10	185, 117
Montana	2	3	20, 524	2	3	58, 835
Nebraska	3	4	30, 886	3	4	82, 752
New Hampshire	2	3	27, 432	2	3	69, 838
New Jersey	1	2	21, 540	1	2	53, 096
New Mexico	1	3	14, 021	2	4	56, 922
New York	17	31	339, 963	21	44	1, 071, 475
North Carolina	5	10	67, 871	6	13	215, 730
North Dakota	3	6	44, 502	3	6	109, 060
Ohio	8	18	184, 508	8	19	486, 949
Oklahoma	3	7	47, 550	4	8	179, 856
Oregon	2	4	28, 042	3	7	113, 365
Pennsylvania	7	13	111, 152	12	23	410, 414
Rhode Island				2	3	36, 832
South Carolina	1	2	8, 127	1	3	24, 395
South Dakota	2	4	24, 588	2	4	59, 792
Tennessee	2	3	27, 229	3	5	94, 233
Texas	8	13	91, 441	11	17	302, 311
Utah	2	3	16, 256	3	5	65, 533
Vermont	1	2	14, 631	2	3	47, 834
Virginia	1	2	20, 117	3	5	82, 273
Washington	4	10	81, 078	5	11	215, 252
West Virginia	2	3	29, 465	2	3	74, 142
Wisconsin	8	12	140, 008	10	17	425, 245
Wyoming	1	1	6, 095	1	1	17, 699
Puerto Rico	1	4	32, 106	1	5	85, 144

[1] No awards were made to institutions in Alaska, District of Columbia, Nevada, Guam, or Virgin Islands.

Source: Division of Health Manpower Educational Services, Bureau of Health Professions Education and Manpower Training, National Institutes of Health.

Table 4. Basic Improvement Grants: Programs and Enrollments by Discipline in Institutions Awarded Grants in Fiscal Year 1967 and 1968

Curriculum	Programs [1]			Enrollment [1]				
	1961	1965	1967	1961	1965	1967	1968	1969
Total	384	451	[2] 482	7,775	11,767	15,665	18,101	19,498
Baccalaureate:								
Dental hygienist	14	16	19	510	633	835	855	947
Dietitian	70	75	75	831	1,192	1,607	1,945	2,159
Medical record librarian	12	16	14	78	175	272	319	329
Medical technologist	148	163	166	2,626	4,178	5,692	6,880	7,432
Occupational therapist	28	29	31	948	1,340	1,780	2,024	2,159
Optometric technologist	...	...	...	...	...	...	...	...
Physical therapist	39	46	52	1,091	1,673	2,409	2,541	2,702
Radiologic technologist	3	4	3	30	36	51	56	39
Associate Degree:								
Dental assistant	15	20	18	284	497	478	542	540
Dental hygienist	22	33	34	760	1,089	1,176	1,325	1,386
Dental laboratory technician	3	4	10	80	95	198	238	205
Dietary technician	5	8	10	109	195	203	267	299
Inhalation therapy technician	...	...	2	...	...	18	33	42
Medical laboratory technician	7	10	12	194	329	394	428	495
Medical record technician	1	4	7	21	41	82	110	124
Occupational therapy assistant	1	1	2	4	12	30	35	40
Ophthalmic assistant	2	2	2	63	50	48	58	62
Optometric technician	...	...	...	...	...	...	...	...
X-ray technician	14	20	25	103	230	392	503	538

[1] Data as of Oct. 15 of 1961, 1965, and 1967; projections for 1968 and 1969.

[2] Projections for 1968 and 1969 are the same as 1967. Includes 7 institutions offering both the baccalaureate and associate degree in dental hygiene.

Utilization of Grant Funds

Recipients of Basic Improvement Grants budgeted more than 40 percent of their awards to support teaching faculty in both 1967 and 1968. Purchase of equipment for use in the teaching programs was the second largest item reflected in the budgets for both years, accounting for about 30 percent of the allocations. These were followed in descending order by salaries for supporting staff (11 percent) and alteration and renovation of teaching space (7 percent).

Plans for utilization of funds varied between the 2- and 4-year institutions. The colleges and universities budgeted the bulk of funds for faculty salaries; the junior and community colleges budgeted the largest proportion of their grant funds for the purchase of equipment. Junior and community colleges allocated smaller percentages for salaries of supporting staff and for alteration and renovation than the 4-year institutions.

Regional Analysis

An analysis of the distribution of Basic Improvement Grants in the nine Department of Health, Education, and Welfare regions shows that the dollars awarded have not been proportionate to the needs identified by hospitals. The dollars distributed in Basic Improvement Grants are related to the best available measure of manpower need in those regions (see table 6). The measure of need used for this analysis is the number of existent budgeted vacancies, plus estimates of additional present needs for various types of health per-

Table 5. Basic Improvement Grants: Awards by Curriculum, 1967 and 1968

Curriculum	Fiscal year 1967	Fiscal year 1968
Total	[1] $3,285,000	[2] $9,750,000
Baccalaureate:		
Dental hygienist	175,365	473,554
Dietitian	356,014	1,127,442
Medical record librarian	51,412	197,075
Medical technologist	1,167,815	3,516,741
Occupational therapist	359,265	999,726
Optometric technologist		
Physical therapist	475,091	1,401,052
Radiologic technologist	14,632	38,745
Associate Degree:		
Dental assistant	121,516	299,478
Dental hygienist	299,116	708,419
Dental laboratory technician	28,449	142,545
Dietary technician	57,914	144,936
Inhalation therapy technician	4,064	18,177
Medical laboratory technician	58,116	245,866
Medical record technician	23,165	72,707
Occupational therapy assistant	5,283	23,917
Ophthalmic assistant	14,833	32,527
Optometric technician		
X-ray technician	72,950	307,093

[1] Amounts are 40.6 percent of the statutory formula.

[2] Amounts are 95.7 percent of the statutory formula.

sonnel in hospitals as they were reported by hospital administrators in the 1966 American Hospital Association/Public Health Service survey of hospital manpower.[11]

SPECIAL IMPROVEMENT GRANTS may be awarded to an institution for which a Basic Improvement Grant application has been approved. The Special Improvement Grant may be used to provide, maintain, or improve the specialized function that the training center serves.

The grants are made on a project basis, utilizing funds remaining after the Basic Improvement Grant entitlements are satisfied. Inasmuch as funds for Basic Improvement Grants have not been sufficient to make awards to schools at the level of full entitlement, no funds have been available for Special Improvement Grants; and no awards have been made. There has been, therefore, no experience with grants of this type.

Advanced Traineeship Grants

Traineeship grants are awarded to public or nonprofit private allied health training centers that in turn make awards to students who have completed the basic professional preparation required for employment in one of the designated eligible disciplines and are pursuing advanced training to qualify them for positions as teachers, supervisors, administrators, or specialists. A traineeship provides for stipend, tuition, fees, and an allowance for dependents. Trainee stipends range from $2,400 to $3,600 dependent on work experience prior to enrollment. An additional $500 is allowed for each dependent.

Three grant cycles have been administered under this authority. The initial traineeship grants totaled $241,977, and were awarded in January 1967 to 12 colleges that offered 17 programs in six disciplines for 64 trainees. In August 1967, traineeship grants totaling $1,203,643 were awarded to 49 colleges that offered 76 programs in 11 disciplines for 257 trainees. In 1968 traineeship grants totaled $1,530,163 and were awarded to 46 colleges offering a total of 69 programs in 11 disciplines for 397 trainees (table 7).

In fiscal year 1967 all approved applications were funded at the levels requested. Approved applications in fiscal year 1968 were funded at a level slightly in excess of 50 percent of the requests submitted by the applicant institutions. There were 23 approved new applications for fiscal year 1969 that will not be funded, because funds are not available for obligation. These unfunded approved applications represent 146 traineeships in 31 programs.

Distribution of Advanced Traineeship Grants

In fiscal year 1967, traineeship grants were awarded to institutions in 10 States. In fiscal year 1968, institutions in 31 States received traineeship grant awards. The institutions awarded grants in fiscal year 1968 received grants in fiscal year 1969, thus enabling them to continue traineeship support at the 1968 level.

Traineeships were distributed among 10 disciplines during the three completed grant cycles. In the 3-year total, medical technologists represented the largest number of trainees; dietitians, occupational therapists, dental hygienists, and physical therapists, followed in decreasing order. A total of 13 traineeships were distributed

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[11] *Manpower Resources in Hospitals—1966*. American Hospital Association, Chicago, Ill. 1967.

Table 6. Basic Improvement Grants: Fiscal Year 1968 Obligations in Relation to Hospital Manpower Needs by Public Health Service Regions

Region	Perceived hospital manpower needs [1]			Basic improvement grant obligations			Obligations per unit of manpower needs		
	Total	Baccalaureate level [2]	Associate degree level [3]	Total	Baccalaureate level [2]	Associate degree level [3]	Total	Baccalaureate level [2]	Associate degree level [3]
Total	31,908	16,824	15,084	$7,850,486	$7,195,645	$654,841	$246	$427	$43
I. New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont)	2,238	1,196	1,042	569,701	569,701	....	255	476	....
II. Middle Atlantic (Delaware, New Jersey, New York, Pennsylvania)	7,680	4,119	3,561	1,140,358	884,448	255,910	148	215	72
III. South Atlantic (District of Columbia, Kentucky, Maryland, North Carolina, Virginia, West Virginia)	2,921	1,482	1,439	430,027	385,541	44,486	147	260	31
IV. South (Alabama, Florida, Georgia, Mississippi, South Carolina, Tennessee)	3,447	1,683	1,764	534,305	468,773	65,532	155	278	37
V. East North Central (Illinois, Indiana, Michigan, Ohio, Wisconsin)	6,226	3,222	3,004	1,718,669	1,651,224	67,445	276	512	22
VI. West North Central (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota)	2,608	1,538	1,070	1,035,122	1,005,465	29,657	397	654	28
VII. South Central (Arkansas, Louisiana, New Mexico, Oklahoma, Texas)	2,976	1,509	1,467	761,038	750,994	10,044	256	498	7
VIII. Mountain (Colorado, Idaho, Montana, Utah, Wyoming)	726	428	298	362,103	344,405	17,698	499	805	59
IX. Pacific (Alaska, Arizona, California, Hawaii, Nevada, Oregon, Washington)	3,086	1,647	1,439	1,299,163	1,135,094	164,069	421	689	114

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[1] Sum of budgeted vacancies plus present need estimated by the hospitals.

[2] Curriculums included are: dietitian, medical record librarian, medical technologist, occupational therapist, physical therapist, and radiologic technologist.

[3] Curriculums included are: inhalation therapy technician, medical laboratory technician, medical record technician, occupational therapy assistant, and X-ray technician.

Source: Based on *Manpower Resources in Hospitals—1966.* Chicago, American Hospital Association, 1967.

among optometric technologists, dental assistants, medical record technicians, X-ray technicians, and one inhalation therapy technician. The number of students awarded traineeships by discipline, fiscal year 1967 through fiscal year 1969 follows.

Discipline	*Students*
Total	[1] 481
Medical technology	215
Dietetics	122
Occupational therapy	53
Dental hygiene	40
Physical therapy	38
Optometric technology	4
Dental assistant	3
Medical record librarian	3
X-ray technician	2
Inhalation therapy technician	1

[1] This represents individual trainees. Some trainees receive support for more than 1 year. They are not counted more than once. All awards total 717.

Trainees Work Experience and Proposed Utilization of Training

Ninety-six percent of all traineeship recipients in fiscal years 1967 through 1969 combined had completed 1 or more years of professional work experience prior to enrolling for advanced training. Trainees with more than 4 years of professional work experience after completion of degree or certification requirements account for 46 percent of the traineeships awarded. Trainees with more than 1 year's, but less than 4 years', professional work experience comprise an additional 36 percent of the traineeships awarded during this period. Trainees with 1 year of work experience and those with less than 1 year of work experience account for 14 and 4 percent, respectively.

Teaching careers are planned by 60 percent of the students who have received traineeships. Twenty-one percent are pursuing training that will qualify them as specialists, and 19 percent are preparing for administrative and supervisory positions.

Table 7. Advanced Traineeship Grants: Programs, Traineeships, and Awards by Curriculum: 1967 Through 1969

Curriculum	Fiscal year 1967 [1]			Fiscal year 1968 [2]			Fiscal year 1969 [3]		
	Programs	Traineeships	Awards	Programs	Traineeships	Awards	Programs	Traineeships	Awards
Total	17	64	$241,977	76	257	[4] $1,203,648	69	397	$1,530,163
Dental assistant				1	2	8,440	1	2	7,490
Dental hygienist	1	2	8,600	6	17	83,024	6	29	101,244
Dietitian	2	6	19,869	19	76	384,677	19	116	425,275
Inhalation therapy technician				1	3	8,750			
Medical record technician				2	4	13,540	1	1	3,745
Medical technologist	8	32	122,999	28	89	415,904	27	182	710,185
Occupational therapist	3	10	36,987	8	27	141,435	7	34	134,987
Occupational therapy assistant				2	4	13,540	1	2	7,490
Optometric technologist	1	4	15,699	1	4	16,092	1	1	2,956
Physical therapist	2	10	37,823	7	29	113,146	6	30	136,791
X-ray technician				1	2	5,100			

[1] 12 schools awarded grants January 1967.

[2] 49 schools awarded grants August 1967.

[3] 46 schools awarded grants June 1968.

[4] $296,000 held in reserve for the cost reduction program.

Developmental Grants

Grants awarded in this program have been made to allied health training centers for the development of curriculums for training new types of allied health personnel. The broadened authority of the Health Manpower Act of 1968 provides that grants may be awarded to agencies, institutions, and organizations to develop, demonstrate, and evaluate methods as well as curriculums for the training of known as well as new types of health technologists. The first group of grants to be awarded under the new authority will be made during May 1969. Total appropriations for Developmental Grants in fiscal year 1967 were $20,000; in fiscal year 1968 they totaled $1 million; and for fiscal year 1969, $1,225,000 are appropriated. A summary for fiscal years 1967 and 1968 follows on page 18.

Developmental grants	Fiscal year 1967	Fiscal year 1968
All projects	6	16
New projects	6	10
Continuation projects	0	6
Funds obligated for new projects	$199, 866	$380, 001
Funds obligated for continuation projects	0	$419, 506
Total obligations	$199, 866	$799, 507
Unfunded approved projects	0	9
Funds required for unfunded approved projects	0	$416, 119

Grants totaling $199,866 were awarded to six institutions in six States during fiscal year 1967. The six initial grants were continued, and 10 new projects were awarded grants in fiscal year 1968. The grants for these 16 projects were awarded to institutions located in 10 States and total $799,507.

Examples of the types of projects funded in fiscal years 1967 and 1968 follow.

Extracorporeal Circulation Specialist (Ohio State University)

The development of the curriculum will be concentrated on 2 years of basic study in the physical and biological sciences, including physics, physiology, pharmacology, and anatomy. The final 2 years will be in the School of Allied Medical Services in conjunction with the School of Medicine. Course work during the final 2 years will include studies in medical electronics, hydraulics, fundamental engineering principles, and additional study in physiology and other associated courses in the medical sciences. Didactic and clinical studies will be carried on in close association with the medical faculty. Emphasis will be on correlation of the basic subject matter that relates to the techniques of extracorporeal circulation. Upon completion of training, the graduate will be qualified to operate extracorporeal circulatory systems of all types and medical electronic instrumentation. The graduate will also be equipped to train others in these techniques.

Child Health Associate (University of Colorado)

This project is designed to develop a new type of health professional prepared to accept significant responsibilities in the provision of comprehensive diagnostic, preventive, and therapeutic services to children. This project has been instituted in order to lessen the effects of the deficit of approximately 88,000 pediatricians anticipated by 1980. The curriculum to be developed will consist of 2 years of premedical training, 1 year of basic sciences, 1 year of clinical training, and 1 year of internship. The medical society in Colorado is currently sponsoring legislation that, if enacted, will permit the medical licensing board to license the graduates.

Physical Therapist Assistant (St. Petersburg Junior College)

The purpose of this project is to develop a pilot curriculum for training physical therapy assistants. Graduates of this program will be qualified to perform the duties, functions, and responsibilities that the American Physical Therapy Association has defined as appropriate for performance by a person trained at the associate degree level. A committee composed of representatives from the medical profession, the physical therapy profession, the State department of education, the local medical society, and the college administration has been established to develop the curriculum.

Baccalaureate Program in Toxicology (St. John's University)

Toxicologists receive their training in toxicology either in graduate programs or on the job in medical examiner offices, hospitals, police laboratories, health department laboratories, or industry. This project proposes to develop a baccalaureate curriculum in toxicology that will provide a formal undergraduate entry-level training program for toxicologists.

Institutions awarded Developmental Grants and the titles of the projects funded in fiscal year 1967 and continued in fiscal year 1968 follow:

Institution	*Project*
Ohio State University, Columbus, Ohio	Extracorporeal circulation specialist.
University of Kentucky, Lexington, Ky	Electroencephalography technician.
Montana State University, Bozeman, Mont	Diagnostic microbiology technician.
St. Petersburg Junior College, St. Petersburg, Fla	Health care administrator (midmanagement).
San Francisco State College, San Francisco, Calif	Advanced medical technology.
Georgia Institute of Technology, Atlanta, Ga	Hospital and medical systems engineer.

Institutions awarded Developmental Grants and the titles of the projects initially funded in fiscal year 1968 follow:

Institution	*Project*
St. Mary's Junior College, Minneapolis, Minn	Physical therapist assistant.
Rochester Institute of Technology, Rochester, N.Y	Biomedical photographer.
University of Colorado, Boulder, Colo	Child health associate.
St. Petersburg Junior College, St. Petersburg, Fla	Physical therapist assistant.
University of Southern California, Los Angeles, Calif	Radiopharmacist.
City College of San Francisco, San Francisco, Calif	Orthopedic assistant.
St. John's University, Jamaica, N.Y	Baccalaureate program in toxicology.
University of Alabama, University, Ala	Community practice of occupational therapy.
University of Iowa, Iowa City, Iowa	Nuclear medical technology.
Ithaca College, Ithaca, N.Y	Baccalaureate program in health administration.

Chapter III

Allied Health Manpower Supply and Requirements

Introduction

There are more than 125 identified occupations in the entire health field, with some 250 secondary or specialty designations.[1] The technological advances in medicine in recent years, the rise in demand for a broad range of health services, and the wide variety in the types of activities, places of practice, and length of preparation are important among the factors that account for this tremendous proliferation of occupations and occupational nomenclature. This chapter attempts to consider the supply and requirements for the health occupations, grouped into meaningful functional relationships and identified as to the required educational level for preparation.

Health Manpower Supply

An estimated 3.4 million persons were employed in all health occupations in 1967. This total is nearly 10 times the number employed at the beginning of the century.

The figures in table 8 show the sharp changes in the composition of the health manpower supply, moving from a time when one health worker in three was a physician to a situation in which only one in 10 is a physician. Figure 2 shows these changes over time, particularly the rapid growth since 1940.

These estimates of the health manpower supply in 1967 do not include almost 1 million workers such as clerks, craftsmen, laborers, and others who assist in the provision of health services but whose skills are not primarily in the health field.

Allied Health Manpower Supply

For the purpose of this report, the allied health manpower supply includes some but not all of the medical related, dental related, and environmental health occupations. Excluded from the following discussion are:

(1) Occupations for which specific legislative authority already exists under the Health Professions Educational Assistance Act, the Nurse Training Act, and the Public Health Training authorities of the Public Health Service Act (secs. 306 and 309). Such categories are pharmacist, podiatrist, optometrist, veterinarian, professional nurse, and graduate public health personnel.

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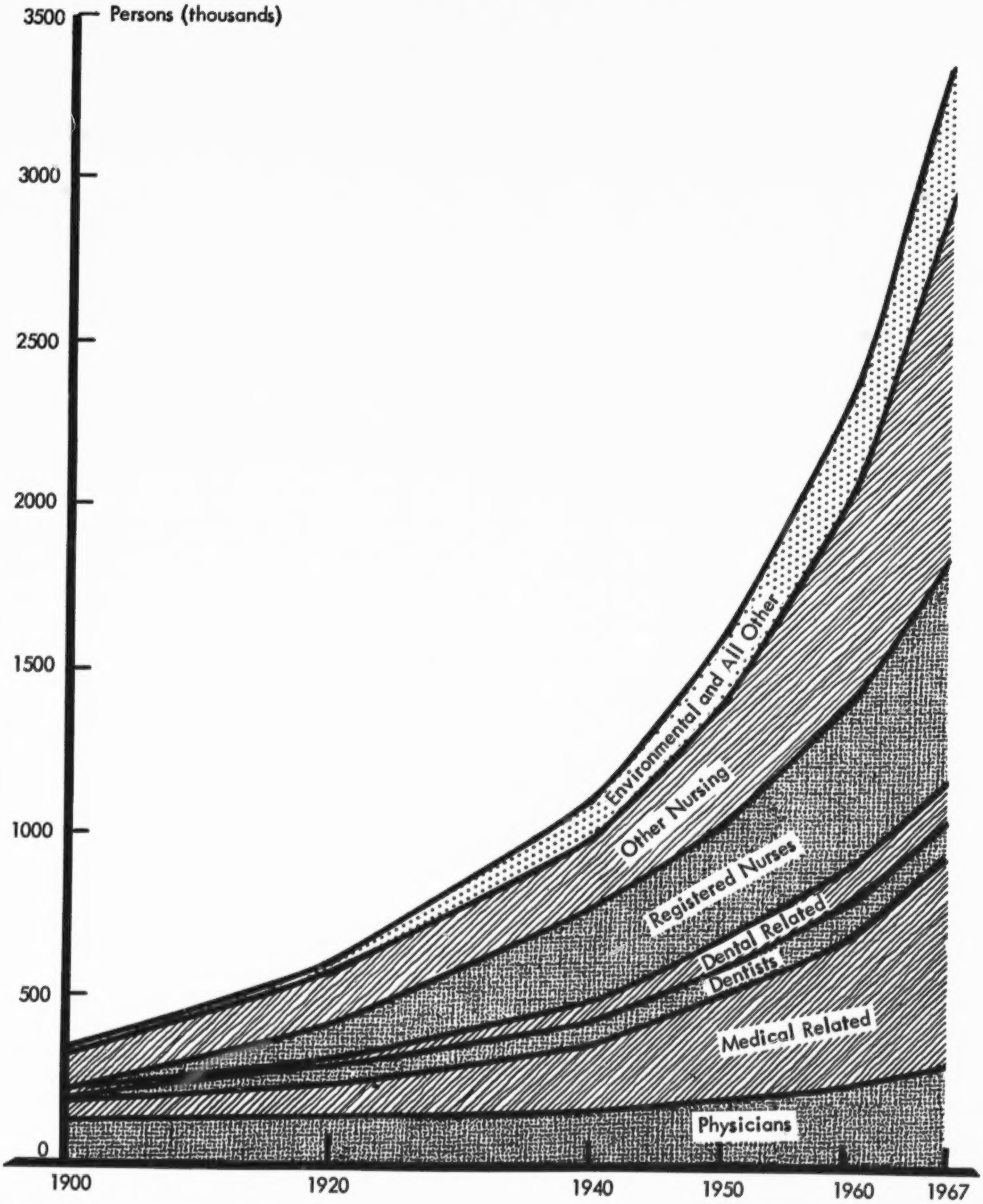
[1] These titles have been compiled by the Division of Allied Health Manpower, Bureau of Health Professions Education and Manpower Training. The list appears as an appendix to *Health Resources Statistics, 1968* (PHS Pub. No. 1509, 1968 edition).

Figure 2. EMPLOYMENT IN HEALTH OCCUPATIONS: 1900 - 1967



(2) Occupations in which transition from the same occupation in other employment fields requires only nominal orientation of the individual to become fully productive.

The allied health workers so defined total about 654,000 persons, of whom approximately 230,000 are in occupations that require at least a bachelor's degree. These groupings are shown in table 9.

The category for which at least baccalaureate preparation is appropriate includes occupations for which the level of education may be the bachelor's, master's, or doctoral degree; internship or residency training; or postdoctoral training. Such education is provided in senior colleges, graduate schools, and free-standing professional schools. Practical or technical training may be part of the academic program through affiliation of the educational institution with hospitals, health departments, and other health facilities and agencies.

For those occupations for which the appropriate basic preparation requirement is less than baccalaureate, the level of formal education may be an associate degree, diploma, or certificate, or none of these. These persons are prepared in junior and senior colleges, vocational and technical schools, hospitals, and other health facilities. Practical and technical training may be part of the academic program through affiliation of the school with the health facility or may be part of on-the-job training, particularly for those occupations for which no college education is required.

Medical Allied Manpower

For this report, certain allied health occupations have been grouped together on the basis of their contribution to medical care, rather than to dental care or environmental control. These are called the "medical allied" occupations. Within this group two categories of manpower are distinguished: (1) Medical allied occupations for which basic occupational preparation at the baccalaureate level is appropriate, and (2) medical allied occupations for which basic occupational preparation at less than the baccalaureate level is sufficient.

This division of the medical allied occupations into two levels is somewhat arbitrary, inasmuch as well-recognized educational standards have not been fixed for all jobs. Many persons working in occupations designated here as baccalaureate level have not had this education. Nevertheless, the two groups require independent assessment and analysis, because the problems of creating and maintaining an adequate work force are essentially different. The designation of specific medical allied occupations by educational level is shown in table 10.

In 1950, the medical allied manpower group numbered 140,000, or 27 percent of the approximately 522,700 in the medical and allied services group (table 9). By 1967 the medical allied workers had increased to more than 450,000, almost half of the 957,000 total.

Table 8. Estimated Employment in Health Occupations: 1900 and 1967

Health occupation	Number of workers		Percent of workers	
	1900	1967	1900	1967
All health occupations	350,000	3,362,000	100	100
Physicians (M.D. and D.O.)	123,000	305,500	35	9
Medical related	60,000	651,300	17	19
Dentists	30,000	98,700	9	3
Dental related	5,000	137,000	1	4
Registered nurses	12,000	659,000	4	20
Other nursing	109,000	1,095,000	31	33
Environmental	11,000	65,000	3	2
All other		350,500		10

Source: Public Health Service estimates.

Table 9. Trend in Employment in Health Occupations: 1950, 1960, and 1967

Occupation within group	1950	1960	1967
Total, all health occupations	1,638,800	2,413,400	3,362,000
Other than "allied health"	1,396,200	1,978,200	2,708,500
"Allied health"—at least baccalaureate	64,500	123,400	229,500
"Allied health"—less than baccalaureate	177,700	311,800	424,000
Medicine and Allied Services, total	522,700	718,700	956,800
Physicians (M.D. and D.O.)	219,900	259,400	305,500
Selected practitioners [1]	162,800	180,100	199,800
"Allied health"—at least baccalaureate [2]	46,500	92,400	175,000
"Allied health"—less than baccalaureate	93,500	186,800	276,500
Dentistry and Allied Services, total	161,100	209,200	235,700
Dentists	77,900	89,200	98,700
"Allied health"—less than baccalaureate [3]	83,200	120,000	137,000
Nursing and Allied Services, total	737,000	1,185,000	1,754,000
Registered nurses	375,000	504,000	659,000
Licensed practical nurses	137,000	206,000	320,000
Nursing aides, orderlies, and attendants [4]	225,000	475,000	775,000
Environmental Health Services, total	19,000	36,000	65,000
"Allied health"—at least baccalaureate [5]	18,000	31,000	54,500
"Allied health"—less than baccalaureate [5]	1,000	5,000	10,500
All Other Services, total [6]	199,000	264,500	350,500

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[1] Optometrists, pharmacists, podiatrists, clinical psychologists, clinical social workers, chiropractors and naturopaths, and lay midwives.

[2] Personnel in administration, biomedical engineering, clinical laboratory services, dietetic and nutritional services, health education, medical record services, occupational therapy, orthotic and prosthetic technology, physical therapy, radiologic technology, specialized rehabilitation services, speech pathology and audiology, vision care (other than ophthalmologists and optometrists), and miscellaneous health services not elsewhere classified.

[3] Dental hygienists, dental assistants, and dental laboratory technicians.

[4] Includes home health aides.

[5] Engineers, scientists, technologists, and technicians in environmental control and food and drug protective services.

[6] Personnel in information and communication, library services, mathematical sciences, natural sciences (other than clinical laboratory services and environmental health), social sciences (other than psychology), secretarial and office services, veterinary medicine, and vocational rehabilitation counseling.

Sources: 1967 estimates based on table 1 in "Measuring the Supply of Health Manpower" by M. Y. Pennell. *Health Manpower, United States, 1965–1967.* Public Health Service Publication No. 1000, series 14, No. 1. Washington, Government Printing Office, 1968. 1950 and 1960 estimates based on table 8 in *Health Manpower Source Book 18, Manpower in the 1960's.* Public Health Service Publication No. 263, sec. 18. Washington, Government Printing Office, 1964.

Table 10. Estimated Employment in Selected Medical Allied Occupations: 1967

Occupations for which the appropriate requirement for basic occupational preparation is: at least baccalaureate		Occupations for which the appropriate requirement for basic occupational preparation is: less than baccalaureate	
Total workers	175,000	Total workers	276,500
ADMINISTRATION:			
Health administrator, program analyst, program representative, systems analyst	[1] 26,000	Health administrative assistant	[1] 16,000
BIOMEDICAL ENGINEERING:			
Biomedical engineer	3,000	Biomedical engineering technician	6,000
		Biomedical engineering aide	
CLINICAL LABORATORY SERVICES:			
Clinical laboratory scientist, technologist	44,000	Clinical laboratory technician, aide	56,000
DIETETIC AND NUTRITIONAL SERVICES:			
Dietitian, nutritionist	30,000	Dietary technician, aide	6,000
HEALTH EDUCATION:			
Health educator	19,800	Health education aide	
MEDICAL RECORD SERVICES:			
Medical record librarian	[1] 8,000	Medical record technician, clerk	[1] 29,000
OCCUPATIONAL THERAPY:			
Occupational therapist	6,500	Occupational therapy assistant, aide	5,000
ORTHOTIC AND PROSTHETIC TECHNOLOGY:			
		Orthotist, prosthetist	3,500
		Orthotic aide, prosthetic aide	
		Restoration technician	
PHARMACY:			
		Pharmacy aide	5,600
PHYSICAL THERAPY:			
Physical therapist	13,000	Physical therapy assistant, aide	7,000
RADIOLOGIC TECHNOLOGY:			
Radiologic technologist		Radiologic technician	85,000
SPECIALIZED REHABILITATION SERVICES:			
Corrective therapist	1,100	Corrective therapy aide	
Educational therapist	500		
Manual arts therapist	900		
Music therapist	2,000		
Recreation therapist	4,000	Recreation therapy aide	
Homemaking rehabilitation consultant	200		
SPEECH PATHOLOGY AND AUDIOLOGY:			
Speech pathologist, audiologist	16,000		
VISION CARE:			
Vision care technologist		Vision care technician, orthoptic technician, optician	23,400
		Vision care aide	
MISCELLANEOUS HEALTH SERVICES:			
Physician's associate		Physician's assistant	
Extracorporeal circulation specialist		Physician's aide	19,000
Other		Community health aide	
		Medical machine technician	8,000
		Inhalation therapy technician	7,000
		Inhalation therapy aide	
		Medical emergency technician	
		Ambulance attendant (aide) and other	

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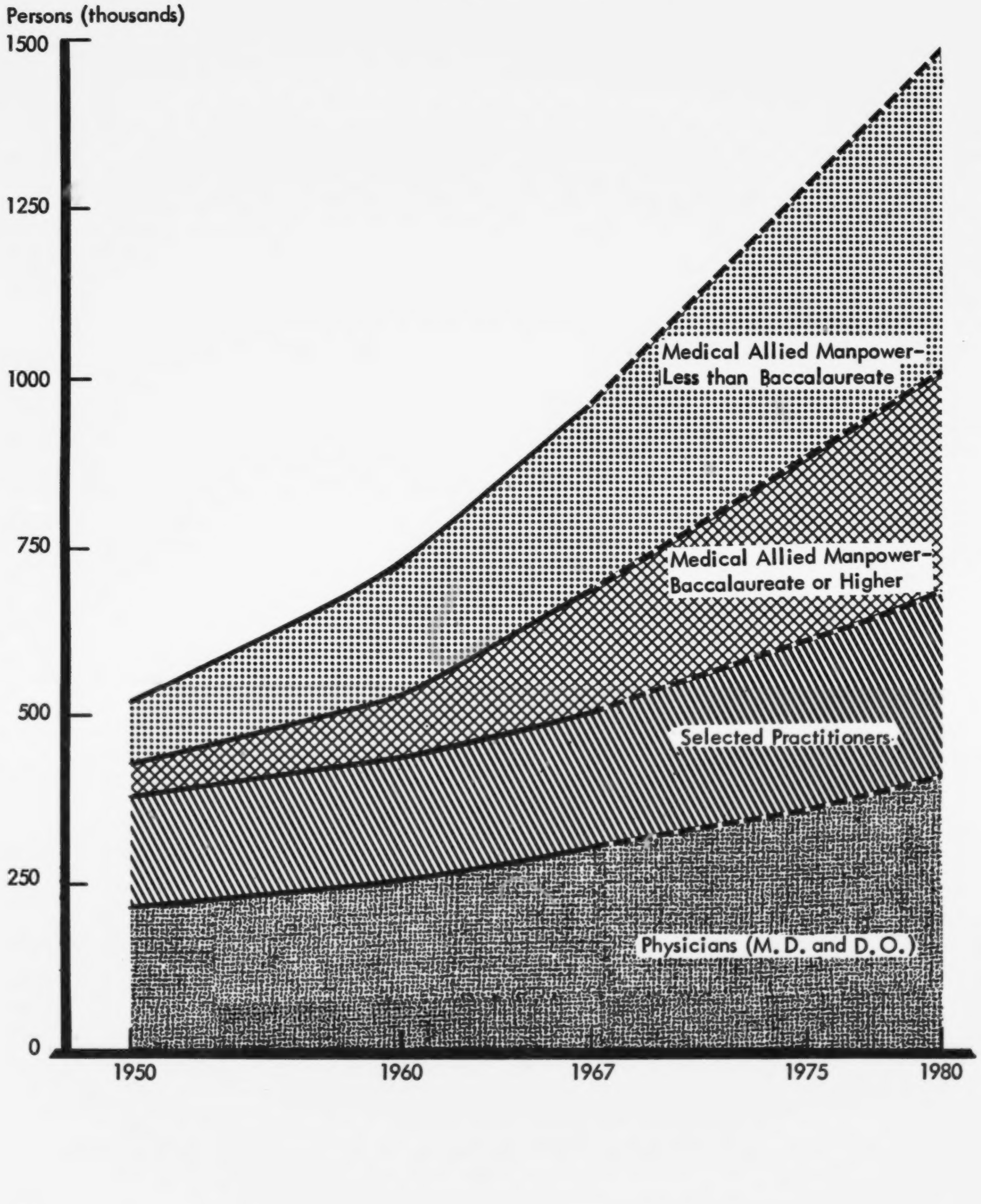
[1] Estimates have been made of the proportions of workers in positions in administration and medical record services which do not require a baccalaureate.

Source: Based on table 1 in "Measuring the Supply of Health Manpower" by M. Y. Pennell. *Health Manpower, United States, 1965–1967.* Public Health Service Publication No. 1000 series 14, No. 1. Washington, Government Printing Office, 1968.

Figure 3. MEDICINE AND ALLIED SERVICES
Employment 1950 - 1980



Personnel Requirements and Employment Levels

There are a number of estimates of national needs for medical allied manpower that, while not based on uniform assumptions or definitions of requirements, are in sufficient agreement to allow some general conclusions to be drawn. The term "requirements" is used here not to represent the number of health workers that would be necessary to provide a fully effective or adequate health system, but rather to represent the number of workers who could find employment without major changes in the health care system, in manpower utilization patterns, or in the economics of health care.

Taking into account all available data, we estimate that there was a deficit of some 110,000 medical allied manpower, as shown below, for 1967.

Medical allied manpower	Baccalaureate or higher	Less than baccalaureate
Requirements	225,000	336,500
Supply	175,000	276,500
Deficit	50,000	60,000

Projected employment levels for medical allied manpower through 1980 are shown in figure 3. To achieve this growth will impose great demands upon educational programs. Because these levels are still below those expected to be required for adequate services, the magnitude of the educational tasks ahead is apparent.

Medical Allied Manpower—Baccalaureate or Higher

The medical allied occupations for which basic occupational preparation at the baccalaureate level or above is appropriate totaled approximately 175,000 in 1967. Administrators (principally those in hospitals and nursing homes), laboratory technologists, and dietitians constitute the three largest groups.

For almost every occupation in this group, surveys which enumerate the persons performing the professional *function* yield larger estimates of the number employed than of the number of registered or certified workers. For example, in 1967 there were approximately 12,500 active dietitians who were members of the American Dietetic Association (ADA). (Membership in the Association or completion of an ADA-approved internship provides the standard of proficiency in this field, in lieu of certification or licensing.) However, about 29,000 persons were estimated to be working as dietitians at the time. A more strict or more lenient interpretation of the functions of a dietitian could change this estimate considerably.

Supply (employment) statistics for the baccalaureate level medical allied occupations, therefore, reflect the persons working regardless of their qualifications. Demand statistics, however, represent a demand for persons trained up to the level of proficiency required by modern standards of medical care.

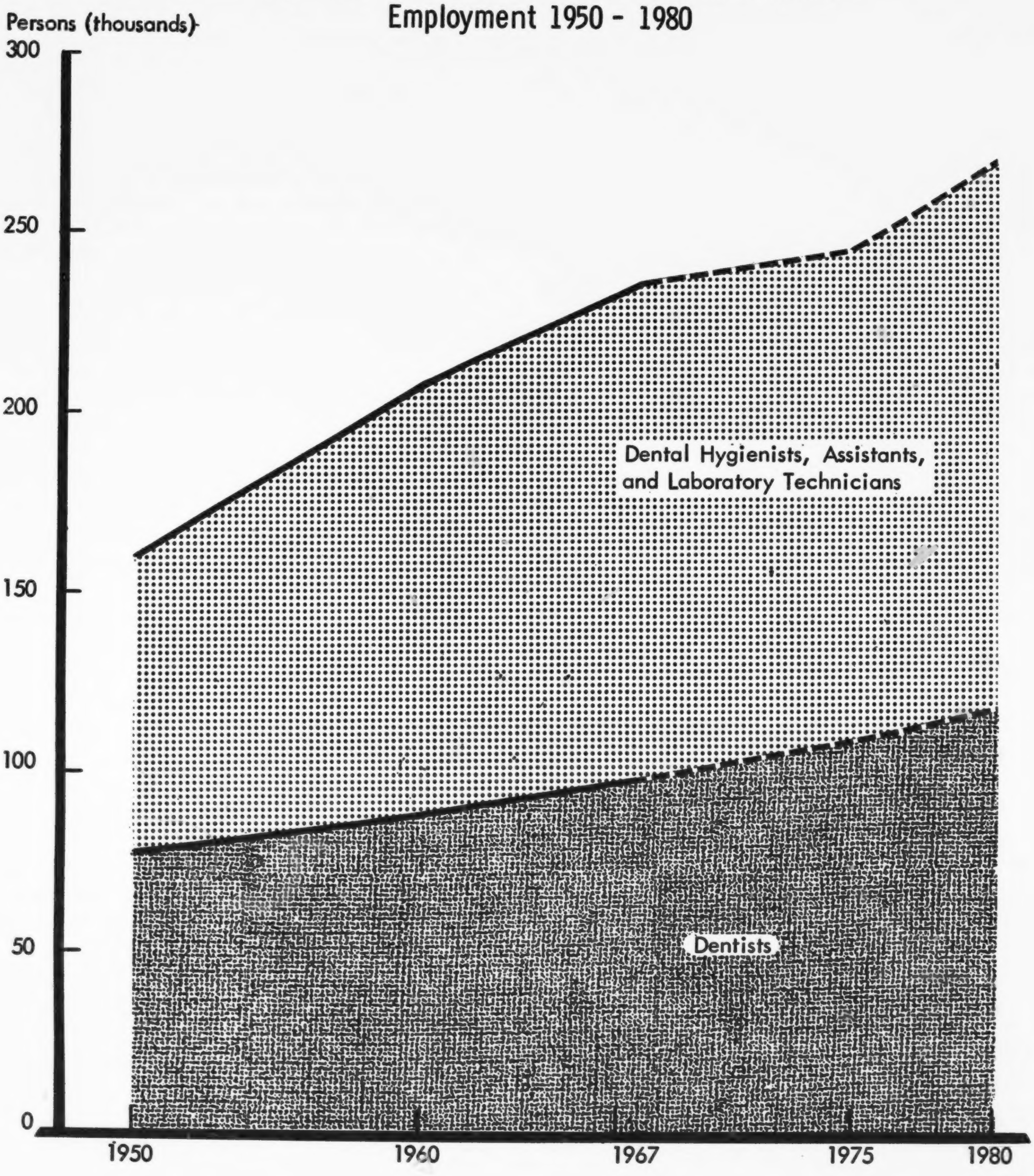
The data available allow a cautious estimate of a current manpower deficit of about 30 percent of supply, or 50,000 additional workers at the baccalaureate or higher level of preparation. Such an increase would not meet all health care needs, but rather would provide a number that could be utilized readily at the present time.

This estimate is consistent with projections by the Bureau of Labor Statistics and with hospital estimates of needs, both of which are tied to employment opportunity. It does not invalidate professional judgments that it would be desirable, in terms of medical care needs, to increase baccalaureate level medical allied manpower by 100 percent now and 165 percent by 1975.

Estimates of the future *employment* of baccalaureate level medical allied manpower are shown in figure 3 and table 14. These estimates are based in part upon predictions of the growth of the health services industry and in part upon projections of recent trends in employment. The 1967 supply of 175,000 workers is expected to increase to 270,000 by 1975. Although it is difficult to anticipate the economic conditions governing the employment of these workers in 1980, it is probably conservative to predict an employment level in that year of 320,000.

Most probably there will continue to be a substantial and harassing manpower shortage. Although the number of graduates is increasing, the current output of new workers is small in proportion to the demand. Relevant educational data are presented in appendix table C–1.

Figure 4. DENTISTRY AND ALLIED SERVICES
Employment 1950 - 1980



Medical Allied Manpower—Less than Baccalaureate

Occupations that require basic preparation at less than the baccalaureate level included an estimated 93,500 workers in 1950 and about 276,000 in 1967. The largest categories are radiologic technicians, clinical laboratory technicians and aides, medical record technicians and clerks, and opticians and vision care technicians. These represent nearly 70 percent of the total.

Occupational terminology is less than precise for many of the occupations in this group. This fact, together with the difficulty of identifying qualified individuals—certification or registration is uncommon, has precluded satisfactory analysis of supply and demand. However, a large proportion of these workers are employed in hospitals, which reported significant shortages in all categories in 1966. From available evidence, it appears that current requirements for subbaccalaureate medical allied manpower exceed supply by about 20 to 25 percent for the group as a whole.

Projections of future employment levels for this group are shown in figure 3 and table 14. The 1967 supply of 276,000 is expected to increase to 400,000 in 1975 and perhaps to 475,000 in 1980, on the basis of projections of current economic and employment trends. However, if adequate numbers of manpower at the baccalaureate level are not prepared, it can be expected that additional subbaccalaureate personnel will be employed.

Training programs for which data are available account for perhaps 7,000 annual graduates (app. table C–2). However, the size of the current work force requires 5 to 10 times this number of annual additions merely to replace losses. Most individuals in this group continue to be trained in apprentice fashion, on the job, or in commercial schools. For many occupations the average length of employment is short, and employment turnover is high. Training capabilities, therefore, will continue to be strained.

Dental Allied Manpower

Although the ratio of dentists to population is expected to be very nearly maintained in future years, this does not mean that adequate dental care will be available. By 1980, demands for dental care are expected to almost double as a result of rising incomes and educational levels, increasing population, and new methods of financing dental services. Inasmuch as the Nation's future supply of dentists will not be adequate, it is necessary that dentist productivity be substantially increased, primarily through much greater utilization of dental allied personnel. Despite the rapid expansion in training facilities for dental auxiliaries that has occurred in recent years, the present prospect is for a continuing shortage of trained dental auxiliaries.

Growth of Dental Manpower

In 1967, there were about 235,700 persons engaged in dentistry and allied services. Active dentists numbered approximately 98,700. The "dental allied" work force of about 137,000 comprises three occupations—dental hygienist, dental assistant, and dental laboratory technician.

Dental occupation	Number of workers	
	1950	1967
All dentistry and allied services.	161, 100	235, 700
Dentist	77, 900	98, 700
Dental hygienist	7, 000	15, 000
Dental assistant	55, 200	95, 000
Dental laboratory technician	21, 000	27, 000

Between 1950 and 1967 the number of active dentists increased by 27 percent, while the number of dental allied personnel rose by 65 percent (fig. 4).

The hygienist provides services directly to the patient and is required in each State to obtain a license to practice. Dental assistants have traditionally been trained on the job by their dentist employers. Similarly, laboratory technicians have largely been trained on the job in commercial laboratories or dental offices.

Educational Programs, 1965–68

The number of programs for the training of dental auxiliaries has grown significantly in the last few years, from 108 in 1965 to 183 in 1968, almost a 70-percent increase (app. table C–3). A large part of this growth is accounted for by the twofold increase in the number of programs for dental assistants, from 50 in 1965 to 101 in 1968. Of these 101 institutions, 28 offered a 2-year training program leading to an associate degree or certificate, six provided both 2- and 1-year certificate programs, and the remaining 67 schools offered only 1-year programs.

Educational programs for dental hygienists increased about 25 percent between 1965 and 1968, from 53 to 67. Ten of these 67 schools offered a 4-year bachelor's degree program, 16 offered both the 4-year program and a 2-year associate degree or certificate program, and the remaining 41 offered only 2-year programs.

Educational programs for dental laboratory technicians numbered five in 1965 but have increased to 15 in 1968. All are 2-year programs, which lead to an associate degree or certificate.

With the growth in educational programs, there have been corresponding increases in the number of dental auxiliary graduates, from 2,851 in 1965 to an estimated 4,250 in 1968, an increase of almost 50 percent. The 1968 graduate total includes 2,200 dental assistants, 1,800 dental hygienists, and 250 laboratory technicians (app. table C–3). An even more substantial increase will occur in the next year or two, when the graduate totals will reflect the recent establishment of a number of new training programs.

Future Personnel Requirements and Supply

If the pressing demands for dental care in the future are to be met, dentists will find it necessary to utilize allied dental personnel in their practices in even greater numbers. Particularly needed will be a substantial increase over present levels in the utilization of dental hygienists and dental assistants. In order to keep pace with the anticipated expansion in utilization of auxiliaries, every 100 active non-Federal dentists in the Nation will need at least 35 dental hygienists by 1980, or twice the ratio of 1967. Increased utilization of assistants will necessitate an increase to about 150 assistants per 100 dentists, compared to a ratio of 105 in 1967. The utilization of laboratory technicians should increase slightly to 35 per 100 dentists in 1980 from a ratio of 30 in 1967. These ratios have been derived from the relationship between increases in productivity and the growth of the auxiliary supply in the past and from the increasing numbers of auxiliaries being employed by young dentists who have been trained in the effective utilization of auxiliaries.

Application of the required ratio for dental hygienists to the expected dentist supply results in a total requirement of 39,200 active hygienists (table 11). Of the 15,000 hygienists in 1967, it is estimated that by 1980 only 8,000 will be active. Dental hygiene educational programs that have been established, as well as those expected to be established in future years, will contribute about 21,900 to the 1980 active supply. Even so, an additional 9,300 active hygienists will be needed to meet the 1980 requirement for hygienists. Part of this

Table 11. Dental Allied Manpower Requirements and Supply: 1967, 1975, and 1980

Requirements and supply	Dental hygienist			Dental assistant			Dental technician		
	1967	1975	1980	1967	1975	1980	1967	1975	1980
Manpower requirements [1]	20,000	30,300	39,200	113,800	136,400	168,000	31,900	35,400	39,200
Manpower supply	15,000	23,700	29,900	95,000	88,200	93,300	27,000	26,800	28,200
From 1967 supply		11,500	8,000		70,000	55,000		23,500	21,600
New graduates since 1967		12,200	21,900		18,200	38,300		3,300	6,600
Deficit	5,000	6,600	9,300	18,800	48,200	74,700	4,900	8,600	11,000

[1] Allied health manpower requirements are related to the supply of active non-Federal dentists: 90,700 in 1967; 101,000 in 1975; 112,000 in 1980. Federal dentists are excluded since these dental services generally train their own auxiliaries. The 1980 ratios are 35 hygienists, 150 assistants, and 35 technicians per 100 active non-Federal dentists.

Source: Public Health Service estimates.

requirement reflects a current shortage of about 5,000 hygienists, according to the number of vacant positions reported by dentists in a national dental manpower survey.

By 1980, a total of 168,000 employed dental assistants will be required according to the derived ratios. About 55,000 of those currently employed in the Nation will be active in 1980. It is expected that the new graduates from dental assistant educational programs will contribute only about 38,300 assistants to the 1980 active supply. As a result, 74,700 additional dental assistants still must be trained.

To provide laboratory services to the dentists who will be active in the Nation in 1980, about 39,200 dental technicians will be required at that time. An estimated 21,600 of the technicians employed in 1967 will still be active in 1980. Only about 6,600 additional technicians will be contributed by dental laboratory educational programs between 1967 and 1980. Therefore, training must be provided for the remaining 11,000 technicians who will be required by 1980.

Future Educational Requirements and Supply

Even though many new auxiliary educational programs have been established in recent years, and despite a rather high rate of expansion foreseen for coming years, the anticipated requirements are far in excess of expected growth. It is essential that plans be developed to increase substantially the number of formal training programs for all three types of auxiliaries, particularly dental assistants.

It is estimated that at least 750 training programs for assistants, averaging more than 28 students per class, will be needed by 1980, preparing 21,000 graduates annually (app. table C–4). At least 225 new training programs for dental hygienists averaging more than 33 students per class will be required, to allow for 7,500 annual graduates by 1980. In order to prepare the 2,200 trained laboratory technicians needed annually by 1980, a total of 90 educational programs, averaging at least 25 students per class, will be required. Attrition rates among technicians are assumed to be lower than among the other two auxiliaries, and this has been taken into account in estimating the need for training places.

Environmental Health Manpower

Available data relating to the manpower supply and requirements in the environmental health field are more rudimentary than those for dental allied and medical allied manpower. Relatively little information is available on the number of workers in the various environmental health occupations, appropriate types of education and training, and the specific functions suitable to different kinds of environmental health activities.

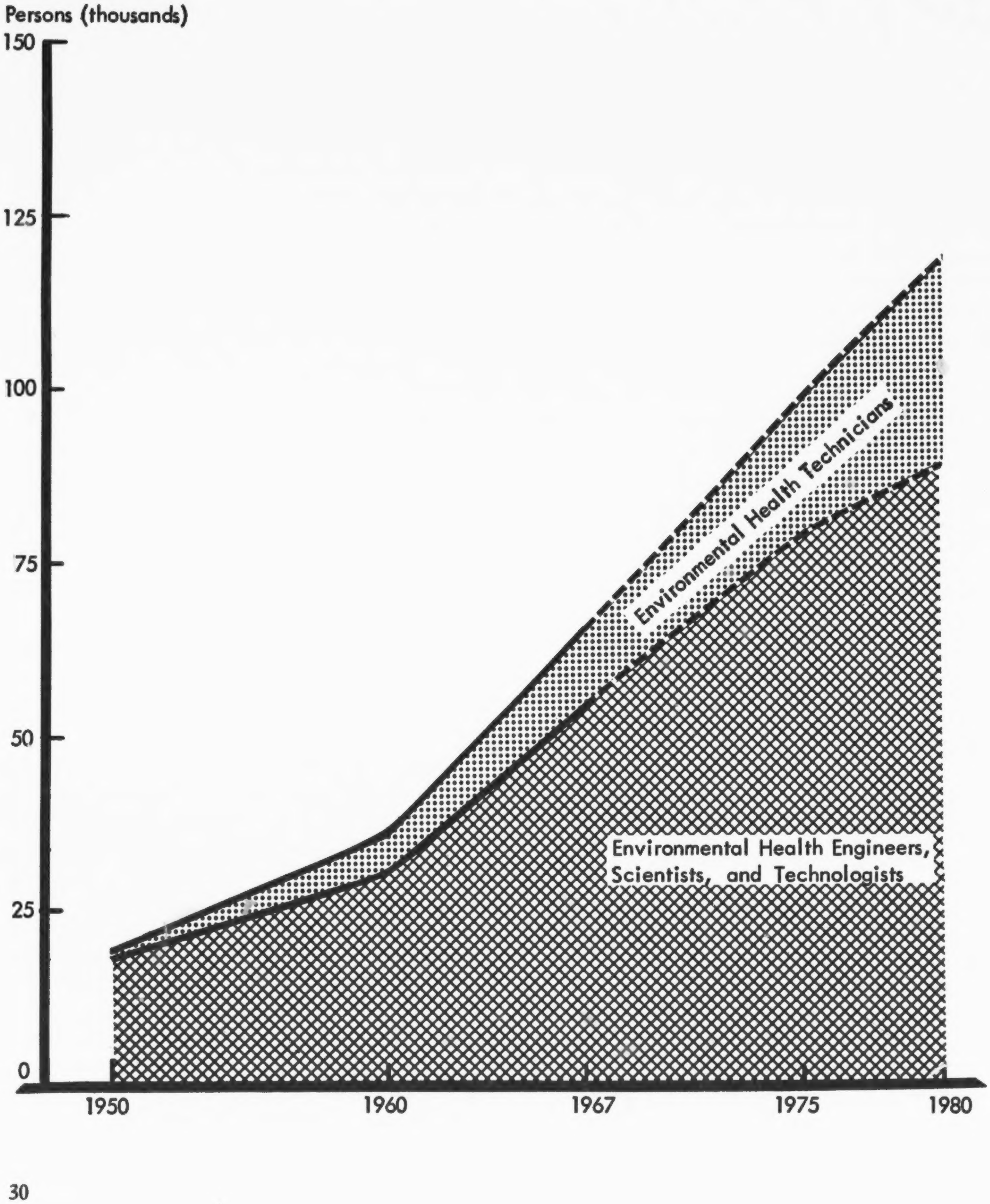
Environmental health problems call for a multidisciplinary approach combining the efforts of engineers, scientists, physicians, administrators, technologists, and related personnel. These persons engage in research and development activities, in teaching, and in the application of knowledge to the prevention and control of environmental hazards. The diversification of their activities is indicated by the partial list given below:

Accident prevention
Air pollution control
Drug quality control
Food sanitation
Hospital engineering
Housing hygiene
Industrial hygiene
Milk inspection
Pesticide control
Radiation protection
Rodent control
Solid waste disposal
Water pollution control
Water supply and treatment

Organized environmental health activities require a body of knowledge and technology showing the relationship between man and his environment. For example, chemists conduct research that may shed new light on the problems of pesticides. Zoologists investigate the tolerance of aquatic flora and fauna to temperature changes in order to predict the consequences of thermal pollution of streams. Botanists determine the effects of air pollution on plant life. Physicians and psychologists study man's tolerance to various stresses.

Technicians assist in a variety of tasks. Examples are: (*a*) the operation and maintenance of pollution control facilities, environmental monitoring devices, and scientific laboratory apparatus; (*b*) the surveillance and

Figure 5. ENVIRONMENTAL HEALTH SERVICES
Employment 1950 - 1980



routine inspection of industrial and commercial sites to determine compliance with laws and regulations; and (*c*) the enforcement of public health standards.

Environmental Health Manpower Supply

The number of workers in the United States who should be considered "environmental health manpower" cannot be stated precisely. Approximately 150,000 professional, technical, and supportive workers may be considered as engaged in organized environmental health activities in the United States in 1967 (table 12). Perhaps as many as 65,000 or slightly less than half the total, are expected to have some expertise in environmental health, in order to function effectively in the varied aspects of environmental quality management and food and drug protective services. These are the persons classified as environmental health manpower for the purposes of this report. It must be emphasized, however, that all personnel engaged in environmental health activities should have an appreciation of the effects of their work on the delicate balance between man's health and his environment in order to become fully effective.

Table 12. Personnel Engaged in Environmental Health Activities and Those Classified as Environmental Health Manpower: 1967

Occupation	Total workers	Environmental health manpower [1]
All environmental health activities	150,000	65,000
Engineers, scientists, and technologists	75,000	54,500
Technicians	75,000	10,500
Environmental quality management	100,000	40,500
Engineers, scientists, and technologists	40,000	33,000
Technicians	60,000	7,500
Food and drug protective services	50,000	24,500
Engineers, scientists, and technologists	35,000	21,500
Technicians	15,000	3,000

[1] Persons for whom an appropriate requirement for basic occupational preparation is some environmental health education.

Source: Public Health Service estimates.

About 19,000 workers could be considered as environmental health manpower in 1950. By 1960, this number had increased to approximately 36,000; the growth for the 10-year period was nearly 90 percent. Since 1960, the work force has grown at an even faster rate, adding another 80 percent and reaching 65,000 by 1967 (fig. 5).

The 54,500 engineers, scientists, and technologists identified in table 12 are considered to require, as basic occupational preparation, at least baccalaureate level training including some specialization in environmental health. The 10,500 technicians are considered to require preparation at the associate degree level or the equivalent, including some specialization in environmental health.

Future Manpower Supply and Requirements

At the present time it is exceptionally difficult to make reliable estimates of future environmental health manpower supply or requirements. Available information is sparse and incomplete, and there is lack of understanding of the respective roles and functions in the various environmental health disciplines. The estimates in this chapter represent current interpretations which must be considered in light of the paucity of meaningful data.

The estimated supply of environmental health workers (excluding aides) can be expected to increase from 65,000 in 1967 to about 100,000 in 1975 and to 120,000 by 1980 (table 13). This projection assumes that the proportion of scientific and technical personnel in the United States that is now allocated to environmental quality management and food and drug protective services will continue unchanged. A significant increase in environmental health efforts could alter these figures. New and expanded specialized educational programs could also increase the future supply of qualified professionals, perhaps by as much as 25 percent at the baccalaureate level.

A principal determinant of the numbers employed in environmental health activities in both the public and private sectors is the funds allocated by Federal, State, and local governments for protecting the health of the public against environmental hazards. Because eco-

Table 13. Environmental Health Manpower Supply and Requirements: 1950 through 1980

Occupation	1950	1967	1975	1980
Manpower supply	19,000	65,000	100,000	120,000
Environmental health engineers, scientists, and technologists	18,000	54,500	80,000	90,000
Environmental health technicians	1,000	10,500	20,000	30,000
Manpower requirements		125,000	170,000	205,000
Environmental health engineers, scientists, and technologists		105,000	135,000	155,000
Environmental health technicians		20,000	35,000	50,000

Source: Public Health Service estimates.

nomic limitations on the employment of environmental health manpower are largely influenced by government actions at all levels of government, requirements are much less predictable than for other aspects of health care.

The estimated requirements for environmental health engineers, scientists, technologists, and technicians in 1975 and 1980, presented in table 13, have been developed without regard to economic limitations on the numbers available for employment. They represent professional judgments of staffing required to decrease environmental health hazards in the face of an expanding problem. With a projected need for approximately 205,000 environmental health workers (excluding aides) in 1980 and a predicted supply of only 120,000, the deficit could be as much as 40 percent of the required work force.

No requirements are projected for aides who require less training than the equivalent of an associate degree. At this level, specialization and formal training are only beginning to appear. Prospects of successful large-scale utilization of aides are too indefinite to allow requirements to be estimated, or even for supply to be predicted.

Environmental Health Educational Programs

The growth in environmental health manpower has been accomplished, by and large, without the aid of specific educational programs that provide basic occupational preparation for specialized program areas. As technology advances and the subject matter grows more complex, it can be expected that an increasing number of positions cannot be filled satisfactorily. For example, unpublished data from a survey of State and local health departments revealed that 22 percent of the positions for air pollution engineers were vacant in 1967. Many of the positions for which it would be appropriate to require specialized training in environmental health are filled by persons without this background. Increasing limitations upon employment due to lack of educational programs are probable, although the magnitude of this constraint cannot be predicted.

The minimum educational requirement for environmental engineers, scientists, and technologists (sanitarians and others) is the bachelor's degree. However, the trend is toward a requirement of graduate education in one of the basic disciplines or in an area of categorical program specialization.

Most engineers now enter the environmental health field at the baccalaureate level, having completed curriculums in civil, chemical, or mechanical engineering. In the academic year 1965–66, only 181 master and 23 doctoral degrees in environmental engineering were conferred.

The environmental technologist usually has a baccalaureate with a major in environmental health, food science and technology, or a related science such as chemistry, biochemistry, biology, or bacteriology. Approximately 150 persons graduate annually with majors in environmental health from the 30 academic institutions that offer undergraduate 4-year programs in that area. Earned degrees in food science and technology in 1965–66 included 240 bachelor's, 123 master's, and 57 doctor's. Nineteen industrial hygiene programs provided approximately 90 graduates in 1965.

The minimum appropriate educational requirement for the environmental technician is an associate degree in environmental health or related areas of specialization. A small number of junior colleges and technical institutes now offer training in environmental health or similar areas.

Allied Health Manpower Projections to 1975 and 1980

Allied health occupations constitute an important part of all health manpower. They have played a significant role in the development of personnel available for the provision of health services and for environmental control and protective services, as well as for teaching, research, and administration. They are expected to increase in importance in the future.

Growth in Allied Health Manpower

In 1967, allied health workers numbered approximately 654,000 and constituted 19 percent of the labor force in all health occupations. The allied health category had almost tripled its work force since 1950, at which time its share of the total amounted to 15 percent.

The phenomenal growth during the fifties and early sixties, however, is not anticipated to continue into the seventies and eighties. By 1975, workers in all allied health occupations are expected to total nearly 909,000 with a further increase to 1,066,000 by 1980.

Baccalaureate level personnel comprised 27 percent of all allied health manpower in 1950. This increased to 35 percent by 1967. Thus the "allied health—at least baccalaureate" group has grown at a pace somewhat exceeding that of the subbaccalaureates. A further slight gain, to 38 percent, is anticipated by 1980, as shown below.

Year	Allied health manpower as a percentage of all health manpower	Baccalaureate level personnel as a percentage of allied health manpower
1950..........	15	27
1960..........	18	28
1967..........	19	35
1975..........	21	39
1980..........	21	38

Future Supply of Allied Health Manpower

The projections of the supply of allied health workers shown in table 14 are based on different assumptions for the three categories of medical, dental, and environmental health services, as has been explained. For each category, however, it has been assumed that there will be continuing social and economic pressure to increase the supply, that the supply is least elastic for the occupations that require the most preparation, and that any lack of adequate educational resources will be reflected in greater use of workers with less than adequate preparation—a result that could have a devastating effect on the quality of health services.

In general, the supply projections postulate no sudden changes in the health care system. They are consistent with the projected 31 percent increase in all health occupation employment between 1967 and 1975—a forecast based upon expected increase in the gross national product and the percentage devoted to health care. Total employment projections for 1980—over 5 million in all health occupations—is a much less precise figure.

Total allied health manpower is projected to increase 39 percent to 909,000 by 1975. By 1980, 1,066,000 workers are expected, or 63 percent more than in 1967.

As a percentage of total workers in all health occupations, allied health manpower has increased rapidly in recent years. However, under these conservative assumptions it is expected to increase more slowly in the future. Only a slight increase is projected in the proportion of allied health workers who are at the baccalaurate level.

Requirements for Allied Health Manpower

Current and possible future requirements for manpower are summarized in table 15. The assumptions for the medical, dental, and environmental health fields are noted in the respective sections of this chapter. Essentially, the estimates of environmental health manpower requirements are set without regard to economic constraints, while those for allied medical and dental in one way or another reduce theoretical requirements to a figure reflecting economic demand.

For medical allied manpower the 1967 requirements have been estimated for the types of manpower now employed. However, these requirements have not been projected to 1975 and 1980 in view of the current interest in establishing new occupations in this group and other uncertainties. Considering the basis for supply projections for the medical allied group, it seems reasonable to expect that requirements, in the sense of employment opportunities for well-qualified individuals, will continue to exceed supply.

Shortages of allied health manpower can be expected to be greater in 1975 than they are now. This trend is expected to continue to 1980. The numerical extent of the shortage is uncertain and perhaps is less important than the percentage of the work force that will have had adequate training.

Table 14. Estimated Employment in Health Occupations: 1967 and Projections to 1975 and 1980

Occupation within group	1967	1975	1980
Total, all occupations	3,362,000	4,421,500	5,038,300
Other than "allied health"	2,708,500	3,512,500	3,972,300
"Allied health"—at least baccalaureate	229,500	350,000	410,000
"Allied health"—less than baccalaureate	424,000	559,000	656,000
Medicine and Allied Services, total	956,800	1,281,500	1,477,300
Physicians (M.D. and D.O.)	305,500	361,500	407,300
Selected practitioners [1]	199,800	250,000	275,000
"Allied health"—at least baccalaureate	175,000	270,000	320,000
"Allied health"—less than baccalaureate	276,500	400,000	475,000
Dentistry and Allied Services, total	235,700	248,000	271,000
Dentists	98,700	109,000	120,000
"Allied health"—less than baccalaureate	137,000	139,000	151,000
Nursing and Allied Services, total	1,754,000	2,362,000	2,720,000
Registered nurses	659,000	816,000	895,000
Licensed practical nurses	320,000	546,000	675,000
Nursing aides, orderlies, and attendants	775,000	1,000,000	1,150,000
Environmental Health Services, total	65,000	100,000	120,000
"Allied health"—at least baccalaureate	54,500	80,000	90,000
"Allied health"—less than baccalaureate	10,500	20,000	30,000
All Other Services, total	350,500	430,000	450,000

[1] Optometrists, pharmacists, podiatrists, clinical psychologists, clinical social workers, chiropractors and naturopaths, and lay midwives.

Sources: 1967 estimates based on table 1 in "Measuring the Supply of Health Manpower" by M. Y. Pennell. *Health Manpower, United States, 1965–1967*. Public Health Service Publication No. 1000, series 14, No. 1. Washington, Government Printing Office, 1968. 1975 and 1980 projections by the Bureau of Health Professions Education and Manpower Training, Public Health Service.

Table 15. Allied Health Requirements and Supply: 1967, 1975, and 1980

Occupational category	Item	1967	1975	1980
Total allied health manpower	Supply	653,500	909,000	1,066,00
Allied health—at least baccalaureate	Supply	229,500	350,000	410,000
Allied health—less than baccalaureate	Supply	424,000	559,000	656,000
Allied Health—at least baccalaureate:				
Medical allied manpower	Requirements	225,000		
	Supply	175,000	270,000	320,000
	Deficit	50,000		
Environmental health manpower	Requirements	105,000	135,000	155,000
	Supply	54,500	80,000	90,000
	Deficit	50,500	55,000	65,000
Allied Health—less than baccalaureate:				
Medical allied manpower	Requirements	336,500		
	Supply	276,500	400,000	475,000
	Deficit	60,000		
Dental allied manpower	Requirements	165,700	202,000	246,000
	Supply	137,000	139,000	151,000
	Deficit	28,700	63,000	95,000
Environmental health manpower	Requirements	20,000	35,000	50,000
	Supply	10,500	20,000	30,000
	Deficit	9,500	15,000	20,000

Source: Public Health Service estimates.

Chapter IV

Allied Health Manpower Education and Training Needs

A review of the historical development of the majority of allied health professions and occupations, coupled with the evidence of shortages of well-prepared allied health personnel, indicates clearly the need for—

- education and training of existent types of allied health personnel;
- experimentation and demonstration in education and training of new types of allied health personnel;
- maximum utilization of the capabilities of well-prepared allied health personnel; and
- recruitment and retention of trained allied health workers in the work force.

In order to increase the quantity and to improve the quality and utilization of allied health manpower to meet the health needs of the Nation, it is essential to—

- obtain more reliable data about the allied health manpower supply and requirements;
- improve curriculum content and teaching methods for the allied health professions;
- develop methods for recruitment, retention, and retraining of allied health workers;
- increase the capabilities of institutions to provide training programs of high quality for the allied health professions and occupations;
- increase the manpower pool from which to recruit allied health workers by eliminating the barriers that prevent the economically, educationally, or socially disadvantaged from undertaking health careers; and
- stimulate the development and dissemination of information related to supply, requirements, recruitment, education, and utilization of allied health manpower.

Development of Information and Data on Allied Health Manpower

Many social, economic, and technological factors are affecting the demands for health services.

- The Nation's population is expected to increase by 50 million between the 1965 and 1980 levels. This increase includes 5 million more people over 65 years of age and 2 million more infants.
- The concentration of the population in urban areas is amplifying physical, mental, environmental, and social health problems.
- As the average education and socioeconomic levels of our society are rising, public demands for health services are increasing.
- Scientific and technological advances are making it possible for man to attain and maintain a higher level of health.

Planning for the education and training of allied health personnel at local, regional, and national levels requires extensive data on allied health manpower that are not now available. Changing patterns for the delivery of health services are creating continuous changes in the requirements in numbers and types of allied health personnel. As experimentation in the delivery of health services continues and methods develop that could be incorporated into practice, accurate evaluations of personnel requirements will be needed. The numbers and types of personnel as they relate to the quality and cost of care will require careful scrutiny.

Plans must be established for gathering comparable data on a sustained basis. If useful data are to be collected on a continuing basis, State and local agencies must develop competency to do the job. If a rational system to meet the needs for health manpower is to be developed, agencies in each State, region, and metropolitan area will need allied health manpower data and personnel to develop these data. For example, present available data cannot provide answers to these questions:

- How many persons are engaged in allied health occupations?
- How many employment opportunities exist for allied health personnel?
- How many opportunities for employment will be available next year and in succeeding years to persons preparing for allied health occupations?
- Where are education and training available?
- Where, next year and in succeeding years, will education and training be available?
- What is the planned capacity of educational institutions to train allied health personnel?
- How many faculty vacancies exist?
- How many faculty vacancies will there be? Where will they be?
- What are the potential sources for filling faculty vacancies?
- How many inactive allied health personnel are there in each occupational category?
- How many inactive allied health personnel could be encouraged to return to active employment, part time or full time? What incentives would be necessary? Would additional training be necessary if they were to return? How could it be provided?

Experimentation and Demonstration

Research and demonstration efforts within the field of allied health manpower must be directed toward three objectives:

- Adequate manpower to meet the Nation's needs for health services.
- Maximum utilization of the education and employment opportunities in the allied health occupational fields.
- Reasonable costs for health services.

Achievement of these goals will depend on the quality and the quantity of the experimentation and demonstration efforts focused on several critical areas. They are:

- Curriculum experimentation and demonstration.
- Development of more effective teaching methods.
- Equivalency examinations and advanced placement.
- Research in continuing education.
- Allied health manpower utilization.
- Analysis of jobs performed by health workers.
- Development of new types of health workers.
- Recruitment, retraining, and retention of allied health workers.

Curriculum Experimentation and Demonstration

Improvement in allied health curriculums—the content, quality, methods of presentation, and accessibility to potential students—is a vital key to increasing the sources of allied health manpower. A critical review of allied health curriculums is needed. Essential curriculum experimentation includes appropriate level of education, content of course, grouping of courses, settings in which the curriculum is offered, and the relationship among educational and service institutions. New methods and patterns for the delivery of health services are being tried. These experiments will contribute to the improvement of practice in the allied health professions and occupations only if they are examined and evaluated by practitioners and educators and are incorporated into curriculums.

Education programs for allied health personnel must be designed so that advancement from entry-level occupations to those requiring additional knowledge, skills, and greater capacities for making judgments are possible. Many health workers are being prepared in programs which do not permit such advancement. They often cannot move to another related health occupation by building on their basic professional preparation and work experience. Rather, they must start from the beginning in another basic professional preparation program, designed for the new job, without appropriate recognition of previous training and experience. Experimentation in curriculum design and the development of courses to bridge the gaps that exist between the levels of competence required for jobs in the allied health occupational fields are needed. Job descriptions are changing rapidly. It is essential that curriculums be developed which will be responsive to the manpower needs of existing and future health-services delivery systems.

Development of Teaching Methods

Parallel to studies and experiments necessary for curriculum development is the need for experimentation with new teaching methods that advances in educational technology have made possible. Such experimentation will have a significant effect on the expansion and improvement of educational opportunities for allied health personnel. Among the important questions to be examined are ones such as:

- How can techniques and equipment be harnassed to provide more students with expert instruction and clinical presentations by teachers and practitioners in the allied health disciplines?
- What is the appropriate balance of training time between didactic instruction and clinical training in a health facility?
- Is the subject matter taught in closely related courses such as anatomy, physiology, and medical terminology learned more effectively when it is presented in three separate courses or in a course which combines them?
- Which elements should be taught in the academic setting and which should be reserved for on-the-job training?
- What is the value of programed instruction as an aid to students preparing for allied health occupations?

Equivalency Examinations and Advanced Placement

Educational concepts and settings are changing from the traditional "classroom-textbook-teacher" situation, to a perspective that recognizes the value of knowledge and skills acquired from a variety of sources. Methods must be developed to determine whether knowledge and skills acquired in other than formal academic settings are equivalent to the measures of "satisfactory" performance established in recognized educational institutions.

The need for equivalency examinations for the allied health professions and occupations is based on the premises that: (1) students should not be required to repeat work that they have mastered, (2) objectives of course work can be achieved in other than classroom situations, (3) acquisition of knowledge and skills can be measured by examination and performance, and (4) educational institutions can use the results of these examinations as a basis for advanced placement or academic credit awards.

Equivalency examinations have far-reaching implications for the health occupations. They could be used to accelerate the formal academic programs of potential health workers. They could also serve as bases for occupational mobility. The potential uses of equivalency examinations have special significance for many allied health workers who are locked in dead-end jobs, but who would be willing to undertake advanced academic training if they were given recognition for principles and techniques that they have already mastered. An example is the medical corpsman who is trained in the Armed Forces, but who cannot accept similar employment in civilian life because his military training and experience cannot be transferred readily to civilian employment requirements in many allied health occupational categories.[1]

Research in Continuing Education

The health knowledge explosion, the rapid development of complex equipment for diagnoses and treatments, and changing ways of delivering health care are placing great stresses on all categories of health-service personnel.

All health personnel need periodically to update their knowledge and improve their skills. This can be done to some extent on the job. However, it is necessary to provide programs for continuing education in separate settings or as scheduled activities during the workday at the employees' work locations.

Continuing education has been hampered by the lack of development of courses, course content, new educational techniques, the inadequate supply of teachers, and the lack of interest on the part of professional personnel. Studies are needed to—

- identify the specific knowledge and skills gaps existing among persons currently employed in the allied health occupations;
- develop methods to attract allied health workers to continuing education programs;
- determine the most effective courses and methods of presenting them; and
- determine how on-the-job performance can be evaluated and used to further the education of the worker.

Allied Health Manpower Utilization

The extent to which the knowledge and skills of those employed in the health professions and occupations are utilized is a primary factor in making health care of high quality available for all who need it. Many services currently performed by the highly trained professional can be performed equally well by persons with considerably less training. Changing health care systems afford opportunities for supervision of the lesser trained health team member by the professional. If maximum utilization of health manpower is to be achieved, improvement at all levels in the quality of education and training demands a reevaluation of duties and functions performed by all trained personnel.

Such investigation of health manpower utilization should include—

- task analyses of health occupations and professions;
- evaluation of duties which can be performed by personnel in the various professions and occupations related to health; and
- investigations to determine what skills and services are necessary in order to incorporate the advances in health technology into systems for delivering health.

The systematic development of new types of health workers is dependent on information derived from such studies.

Through health manpower utilization research, a more rational basis can be achieved for the design of education and training programs for allied health manpower. In addition, planning for allied health manpower in the years ahead requires evaluation of the appropriateness of current certification, registration, and licensing procedures and requirements in meeting their intent to assure quality health care. Such evaluation should include inquiry into such questions as:

- Are certification and licensing procedures reasonable mechanisms for assuring the quality of services that allied health personnel should deliver?
- Is there a need for reexamination of personnel at periodic intervals after completion of the basic professional training?

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[1] See app. D for a description of Project Remed, a Federal program designed to encourage discharged medical corpsmen to utilize their training in civilian life.

- To what extent do credentials systems for health personnel protect the recipients of health services?
- Should opportunities for obtaining credentials be open to persons with varying educational and training backgrounds, or should education and training qualifications be fixed?

Development of New Types of Health Personnel

Advances in medical and environmental research and technology have necessitated the development of new allied health occupations. Some examples are assistants for physicians,[2] the biomedical equipment technician, the extracorporeal circulation specialist, and the air pollution technician. This trend is expected to continue. Education and training resources, therefore, must be prepared to offer necessary instruction and clinical experience related to the new types of jobs.

Also requiring experimentation are determinations concerning the most economical and efficient patterns of health services delivery that utilize new types of health personnel. Some questions that need to be answered before these determinations can be made include the following:

- Is it feasible for the new types of health personnel to perform the work required?
- What should be included in the curriculum?
- Where should the curriculum be offered?
- What teaching methods should be employed?
- Who should be recruited for training?
- How should capability be determined through certification and licensing procedures?
- What will be the professional and public acceptance of these new types of health personnel?

Recruitment

Significant increases in the number of allied health personnel available for employment is dependent on recruitment efforts directed to a variety of potential manpower pools. Young people are a primary source, but other important sources include women with minimum or limited family responsibilities who could work full or part time; the economically, socially, or culturally disadvantaged; retired persons, especially those from the armed services; and the handicapped. Fortunately, work in the health services has a natural appeal for many individuals. Success in recruitment, however, depends on more than appeal. It must be related to the availability of educational and other training opportunities, employment opportunities and incentives, as well as the interests, aptitudes, and abilities of prospective allied health personnel. It must be related to accurate information about the allied health professions including the qualification requirements for employment in specific occupations. It requires informed counseling services through which potential allied health workers are directed into educational programs appropriate to their interests and abilities.

High school graduates who can successfully undertake collegiate education should be encouraged and assisted to complete allied health programs in junior colleges, colleges, and universities. Those for whom the associate degree or baccalaureate program is not appropriate should be encouraged and assisted to prepare for allied health occupations in programs offered by vocational and technical schools, hospitals, or other health-service facilities.

There is evidence that adequate, accurate information on allied health careers is not reaching many potential recruits. High school guidance counselors and other school personnel are often unaware of the many opportunities for students—the various types of programs to prepare students and the wide range of occupations for students with varying interests, aptitudes, and abilities. Recruitment efforts are frequently ineffective because they are fragmented. Particularly serious is the general lack of public understanding about what constitutes the allied health professions and occupations and their related education and training requirements. The physician, the dentist, and the nurse are often the only health personnel with which the public is acquainted.

Efforts on a broad scale are needed to attract adequate numbers to the allied health professions and occupations. Several avenues should be pursued in experimentation, demonstration, and implementation. In particular:

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[2] See app. E.

(1) Health careers councils on the national, State, and local levels need to be strengthened and expanded. They need to be encouraged to continue their programs that provide leadership and direction to the recruitment efforts of hospitals, health departments, professional associations, voluntary health agencies, and other employers of health personnel; that foster the development and production of recruitment literature, films, and the use of the mass media; that provide more effective counseling services in the schools; and that promote general interest in health careers.

(2) Guidance for those who wish to enter the allied health professions and occupations needs to be strengthened and improved in high schools and colleges. The lack of proper and current information on available educational and employment opportunities, particularly in high schools, must be rectified through dissemination of literature, through conferences with health agencies, and through visits to the schools by representatives of the allied health professions. The growth of junior colleges and the increase in allied health professions education in colleges and universities have contributed to an urgent need for informed guidance for students prior to admission to college. There is a need to improve the quality of health careers counseling in secondary and higher education; to make classroom teachers, especially those in the sciences aware of opportunities in the fields of health; to identify potential students for allied health professions and occupations; and to provide greater opportunities for young people in educational institutions to have actual work experience in the health occupations in order to test their interests and aptitudes.

(3) Efforts to reach special groups with high potential for recruitment into the allied health professions and occupations need to be fostered. Counselors must be trained to be familiar with the needs of special groups such as the economically and culturally disadvantaged; the health personnel trained in the Armed Forces who are returning to civilian life; the retirees of all types, military and civilian; women whose family needs have lessened; and the physically and mentally handicapped. Such counselors should work in settings where they can assist persons from such potential manpower groups to enter the allied health field.

(4) The public needs to be informed about occupational opportunities in the health field through mass media. Portrayals of jobs in the health occupation must be realistic. They should convey actual on-the-job duties and responsibilities and include the opportunities and limitations of the work requirements. Furthermore, there should be special focus on the opportunities to serve and the satisfactions derived from work in the health field. Television programs, feature articles, public service advertisements, and other mechanisms to inform and educate the public can be effective in developing public understanding about the health and allied health professions and occupations. These, in turn, will serve to give early encouragement to children to choose careers in the health occupations.

Retraining

More women than men are employed in the allied health professions and occupations. Women who enter these professions and occupations upon completion of their basic professional training often leave when they marry or during the early period of child rearing. Attrition, therefore, is high and is a major contributor to manpower shortages. Initial employment is often of short duration and may be the only work experience enjoyed by many women prior to their desire to reenter the labor force some 10 to 20 years later. Consequently, these potential allied health personnel need refresher courses before they return to work. Current performance standards, influenced by rapidly expanding knowledge in the health field and changes in practices and technologies, often require that refresher courses be provided. These must include new content as well as a review of previously acquired knowledge.

The same need for retraining and refresher courses holds for any person away from the health field for any length of time.

Retention

Efforts must be undertaken to retain allied health workers in the labor force. Health personnel often are unaware of the benefits and opportunities that are available to them, and employers are not always aware of the incentives that can be employed profitably to retain workers.

Personnel service units of health facilities should provide counseling services for employees, particularly in the areas of continuation or on-the-job training for advancement in their fields. For example, counselors with special competence in vocational guidance could assist employees with education and training plans; with opportunities for job changes or advancement within the health facility; with information on community services, such as sources of health services and day care for children; and with transportation arrangements. They could also serve as coordinators with educational institutions for placement of graduates in local health facilities.

Institutional and Student Needs

Current education and training patterns in the allied health professions and occupations vary. The available resources are struggling to meet the immediate needs for health personnel. At the same time they are trying to develop educational training patterns that will be pertinent for the future.

When medical care was less complex and widespread than it is today and when resources for preparing health personnel were more limited, hospital-based training programs were by far the major resource to meet the needs. Training programs were developed by health-service institutions in response to their own needs. As the programs developed, the trainees became important manpower resources in the facilities where they were being trained.

When health-service institutions first accepted responsibility for training allied health personnel, scientific and technological progress was not as rapid as it is today, and requirements for patient care were not as great. Consequently the need for continuous modification of curriculums was not as critical. However, within the last two decades, as the demands for services have dramatically increased, the health-service facilities have had difficulty meeting the demands for training more personnel in more sophisticated techniques.

As advances in health services developed, inevitably costs began to rise. Concern grew among providers and consumers of services about the propriety of adding the cost of education and training of health personnel to the patient's bill. In other fields, similar costs had customarily been borne by educational institutions, public or private funds, students, and their families.

A manpower crisis in health as well as other sectors occurred almost simultaneously with the public demand for more opportunities for higher education. The 4-year colleges could not meet the demand. Junior and community colleges emerged to provide additional opportunities for the many high school graduates seeking more education. The rapid growth of these institutions during the past few years has been phenomenal. Junior colleges are being established at the rate of about 100 annually, approximately two each week, and are expected to continue at such a rate through the next few years. These 2-year colleges created a new setting for training in a variety of technical areas, including the allied health field.

At the same time, 4-year colleges recognized their role and responsibility for training technologists, teachers, administrators, and supervisors in the health field. In response to this realization, 4-year colleges increased the number of allied health professions programs and expanded the student enrollments.

Although training programs for allied health personnel have increased in educational institutions, the responsibility for the clinical or practicum component of the training has remained in the health-service setting. This portion of the training is vital to the preparation of virtually all allied health personnel.

Today, there is a trend toward the utilization of junior colleges and colleges for the preparation of allied health personnel. However, it is important to view it as just that—a trend—because for the present and immediate future, education in a collegiate setting is not fully meeting the surging needs for allied health manpower. Training programs located *in toto* in hospitals and other service institutions are necessary to supply trained workers and should continue until a sufficient number of educational institutions are prepared to assume increased responsibilities for appropriate portions of allied health education. Clinical experiences will continue to be provided in health-service institutions in affiliation with educational instituitions. It is likely that training for some allied health categories, which are primarily skill oriented, will remain based in a health-service setting. Hospitals, health departments, and other providers of health services must continue their commitment to provide the practicum training component, coordinated and integrated with classroom education.

Such planning and coordination must be directed toward the development of an education and training system for allied health manpower which will—

- assure that education and training are carried out in the most effective and efficient period of time, in settings most appropriate and relevant to the level of skill and judgment required by the job;
- provide a flexibility that is responsive to changing and evolving requirements for the delivery of the health services;
- encourage innovation in the organization of educational and training programs, including the types of personnel trained and the methods by which material is presented; and
- enable students to adapt to the changes which will take place in the occupations for which they were originally prepared and give them a sound educational base so that they may change from one occupation to another if they so desire.

Mechanisms of support for allied health professions educational programs should be keyed to these needs as they relate to systems of education and training, and to critical needs for health manpower. They must assist in improving the quality of educational programs and at the same time respond to the need for increased enrollments and graduates. They must complement support provided for general education and for specific mission-oriented health programs such as heart, cancer, and stroke, air pollution, rehabilitation services, and alcoholism.[3]

Teachers

The shortages of competent faculty in training programs at all levels probably constitutes the greatest obstacle to the improvement and enlargement of educational programs for the allied health professions. As educational programs enlarge and new programs are added, the demand for teachers mounts. The teacher shortage in the allied health disciplines is such that basic teaching competence for persons with technical proficiency in these occupations and professions must be achieved in the shortest possible time. While continuation and expansion of traditional teacher training programs requiring a total of 4 to 6 years after high school is essential, innovative teacher training programs utilizing modern teaching methods must be developed to reduce the time required. These programs should be offered on a part-time as well as a full-time basis so that currently employed allied health workers may prepare for a teaching career.

Although most teaching is thought of in terms of classroom settings, most of the allied health occupations require a large component of clinical or practical training. Too often clinical instructors have little or no teacher training, but are selected on the basis of their professional competence as practitioners. Training in teaching techniques could significantly enhance their effectiveness as teachers.

Teaching Facilities

The need is also critical for appropriate classrooms, laboratories, libraries, space for clinical training, and other requirements related to the education and training of allied health workers. This need will become increasingly urgent as resources are pressed to accommodate increased enrollments and to offer new opportunities. If enrollments in the allied health professions and occupations education programs are to be increased, time lag inherent in construction requires that action be taken now.

Many patterns of education for health occupations are found in the various institutions in which allied health personnel are prepared. Some are in large university medical center settings and include curriculums for several allied health occupational fields. Others are in small community colleges where one or two curriculums, selected to meet local needs, are offered. Each setting requires facilities suitable to the setting in which the educational program is offered.

The maximum utilization of facilities is influenced by a number of factors including the extent to which common curriculums are used in the preparation of personnel for more than one health occupation and the extent to which new educational technology is appropriately incorporated into the educational program.

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[3] See app. F.

Facilities must be developed at a rapid rate to keep pace with expanding student enrollments. Data are needed to assist in the planning and design of facilities, as well as for determinations on classroom space requirements, specifications for audiovisual equipment and space in which it will be used, laboratories and laboratory equipment, and other special-purpose space associated with allied health education programs.

If allied health programs are to develop and expand on a rational basis, space needs to accommodate groups of related programs and special space needs for the practice of skills must be taken into account in planning all facets of the institutions that will be responsible for providing education and training in the allied health occupations. Construction of permanent space requires meticulous planning and considerable time. There are, however, immediate needs for space. Institutions often must build temporary structures or rent space to accommodate these needs. Funds to assist in construction, therefore, should be available for immediate and future space requirements.

Institutions

Institutions must maintain and improve the quality of their allied health programs of education and training to sustain and increase the numbers of allied health personnel trained if needed manpower is to be available to provide health services to the American people. Costs of educating allied health personnel have increased steadily in recent years. As enrollments increase, and additional allied health curriculums are added, institutions must obtain additional resources to attract qualified faculties and to provide appropriate clinical experiences.

Allied health curriculums must be constantly revised to keep up with changing practices and advancing technology. Allied health programs have special responsibilities for establishing relationships and assuming responsibilities for integrating the educational and clinical components of their curriculums. Changes in patterns of education require modifications of programs, including new combinations between and among different allied health disciplines. These are changes that tax the limited financial resources of the parent institutions but which are vital to the accelerated and efficient production of trained personnel to render health services.

To meet these responsibilities, institutions need assistance to—

- obtain additional and better qualified faculty;
- undertake curriculum revisions to update training programs;
- establish relationships with a wide variety of clinical facilities;
- incorporate new teaching methods into their curriculums;
- expand training capacity;
- obtain specialized equipment essential to the preparation of particular allied health specialties.

In addition to training designed to qualify persons for entry into the allied health professions and occupations, training institutions need assistance in providing other kinds of educational opportunities. They should be encouraged to develop and offer programs designed to meet the special needs of trained, inactive allied health personnel who desire to reenter the work force and the needs of employed allied health personnel to update their skills and knowledge in accordance with new developments and techniques.

Students

Traditionally, students enrolled in hospital-based allied health training programs do not pay tuition and in many cases receive a small compensation for the work they perform in the hospital as a part of their training. However, the primary location of the didactic portion of allied professions education is now moving away from hospitals and other health-service facilities to technical institutes, junior colleges, colleges, and universities. Consequently, students preparing for employment in the allied health professions and occupations now are confronted with room, board, tuition, and other expenses. Potential students may be unable to pursue education and training for the allied health professions and occupations unless financial assistance is available to them. The National Commission on

Community Health Services noted in its report, *Health Manpower—Action to Meet Community Needs,* that student financial assistance is essential to assure an adequate supply of health manpower.[4]

Financial assistance to students comes from many sources, private and public. These sources may provide assistance for narrowly specified purposes or may provide for general assistance to students. The assistance may be limited to students at a specific level of education (i.e., undergraduate or graduate) or in a particular field of endeavor. Financial assistance to students provided by Federal programs has emerged relatively recently. These programs are assuming increasing significance in higher education, but represent only one of the many sources of student aid provided by individuals, private agencies and organizations, and local and State governments.

Available Federal Student Financial Assistance—Capacity To Meet Allied Health Students' Needs

There are several Federal student financial assistance programs available through which undergraduate students, regardless of their particular academic concentration, may apply for support.

- Students with a demonstrated financial need, whose economic circumstances have limited their educational and social opportunities, may be eligible for ***Educational Opportunity Grants,*** which are made for each of 4 years of undergraduate study, in amounts ranging from $200 to $1,000 per academic year. Institutions of higher education participating in the program select the recipients and determine the amount each student needs, in accordance with criteria established by the Office of Education. The institution also provides a matching award to every Educational Opportunity Grants recipient, in an amount at least equal to the Educational Opportunity Grant. The student thereby receives financial assistance designed for his individual needs and circumstances.

This is not a scholarship program. The primary criterion of student eligibility is exceptional financial need, not academic achievement. Any student who has been accepted for admission or is currently enrolled as a full-time undergraduate student is eligible to receive a grant.

To be meaningful for those students in serious financial straits who wish to prepare for employment in the allied health field, such financial assistance should cover costs of tuition, travel, books, supplies, and expenses in pursuing the course of study that he has undertaken.

- Under the ***College Work-Study Program,*** authorized by the Economic Opportunity Act of 1964, students may work an average of 15 hours per week during the school year and 40 hours per week during the summer or other vacation periods. In general, the basic pay rate is the current minimum wage, although a student may receive up to $3.50 per hour for highly specialized work. Their income from this employment may be as much as $700 to $800 per year and may be used to supplement financial aid from other student assistance resources.

This program provides valuable incentives for students who will enter the health occupations and who need the income from part-time employment in order to pursue a graduate or undergraduate course of study. Assurance for opportunities to work should be provided for students enrolled in allied health education programs. Work should be in the health field, located in hospitals, health departments, nursing homes, and other health facilities wherever possible.

- Under the ***National Defense Student Loan Program,*** those who are eligible, by virtue of limited family income, may borrow up to $1,000 each academic year to a total of $5,000. The repayment period and interest do not begin until 9 months after the student ends his studies. The loans bear interest at the rate of 3 percent a year on the unpaid balance, and repayment of principal may be extended over a 10-year period.

As much as half the loan may be forgiven at the rate of 10 percent for each year of teaching service. Borrowers who elect to teach handicapped children, to teach in the Trust Territory of the Pacific Islands, or to teach in certain schools located in areas of primarily low-income families, may qualify for cancellation of their total loan at the rate of 15 percent for each year of service.

- ***Guaranteed Student Loans*** with low-interest rates are available to students whose adjusted family annual incomes are less than $15,000. Any student may apply who has been accepted for enrollment in an eligible school or who is already in attendance and in good standing, and who is a citizen or national of the United States or is in the United States for other than a temporary purpose. Graduate and undergraduate students are eligible and in many States, half-time students may participate. Students desiring loan assistance apply to their own local lending institutions, such as banks, savings and loan associations, credit unions, pension funds, insurance companies, and similar institutions.

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[4] National Commission on Community Health Services, *Health Manpower—Action to Meet Community Needs,* Report of the Task Force on Health Manpower Chapter IV, "Recruitment," pp. 99 and 100. Washington, D.C.: Public Affairs Press. 1967.

Most colleges, universities, schools of nursing, and many vocational and technical schools are eligible. The Office of Education or agencies administering the program of a particular State can provide information regarding the eligibility status of a particular school.

- ***Veterans Readjustment Assistance Act*** provides financial aid to persons honorably separated from the uniformed services to pursue education or training in the area of their choice. Tuition, books, supplies, and stipends are provided during the total period of training to which the veteran is entitled.

Special efforts need to be taken to encourage veterans, especially those returning from the Vietnam conflict, to utilize this resource for support while they are preparing for employment in allied health professions and occupations. Those veterans who have had a significant experience in health or medical activities while they were in one of the services should be particularly encouraged to pursue careers in the health occupations if they have developed an interest in them during their service careers.

- ***Social Security Benefits*** are available to the children of eligible retired, disabled, or deceased workers, provided they are unmarried, full-time students. Under this program eligible students may receive support up to age 22.

- Other mechanisms are available for assistance to a limited number of students pursuing training in such areas as rehabilitation services, radiological health, and specialized diagnostic laboratory services through mission-oriented programs.

These programs are providing some important student assistance. However, they are not easily identifiable by students seeking financial aid, and in some cases funds may not be available in a given year owing to budget limitations.

Special Financial Assistance for Allied Health Students

- Financial aid for students engaged in advanced allied health education and training programs is of particular importance to meet the rapidly growing needs for teachers, administrators, supervisors, and specialists competent to utilize the advances in science and technology for the improvement and extension of the services provided by allied health personnel. Financial assistance to these students engaged in advanced education is, at present, the most needed of all types of student support in the fields of allied health.

- Short-term training programs are essential for updating and improving the knowledge and skills of those already engaged in an allied health occupation. Such programs need to be available for employed allied health personnel to teach them new techniques. They are also needed to update the competencies of allied health personnel who are returning to the labor force after being inactive in their respective fields for a significant period of time.

- Student financial assistance for part-time study would help to solve a number of problems now plaguing employees and employers. Among them are: the retention of personnel, opportunities for advancement in allied health professions and occupations, and upgrading the quality of knowledge and skills required by allied health personnel. It would encourage students who have family and other responsibilities to consider undertaking basic professional preparation for allied health careers.

- Pilot programs related to the development of new types of health workers and experiments in new methods of training require actual student participation in the training phases of the experiment. Adequate student assistance, therefore, should be provided for such students willing to cooperate in the experimental venture.

Summary of Needs

If both the qualitative and quantitative shortages of personnel in the allied health occupations are to be reduced and if the availability of personal and environmental health services is to be substantially improved, a balanced combination of financial assistance must be provided. Such a balance includes: assistance to institutions to maintain, expand, and improve their existing programs and to plan and develop additional programs so that more qualified allied health personnel will be produced; assistance to plan and develop new ways of teaching, new curriculums, and to develop new types of health occupations to meet changing needs for health services; assistance to students undertaking advanced study to become teachers, administrators, and specialists in the allied health occupations; assistance to students who are engaged in preparation for careers in the allied health occupations; assistance to institutions and to students engaged in short-term education and training so essential to increasing the manpower pool; assistance to public and private agencies, organizations, and institutions to assess allied health manpower needs and to create sound plans that will make effective use of the educational and training resources available to educate and train needed allied health personnel and to make efficient use of existing allied health manpower.

Financial assistance to meet these needs must come from a variety of sources to assure a sound development of allied health manpower programs and resources. These include local, State, Federal, and private sources of support. The needs are great. The task of meeting them is complex. That task requires cooperation, integrity, and commitment to purpose by all who have responsibilities for allied health education and services.

APPENDIXES

Appendix A

Allied Health Professions Personnel Training Act of 1966 as amended

Public Law 89-751
89th Congress, H. R. 13196
November 3, 1966

An Act

To amend the Public Health Service Act to increase the opportunities for training of medical technologists and personnel in other allied health professions, to improve the educational quality of the schools training such allied health professions personnel, and to strengthen and improve the existing student loan programs for medical, osteopathic, dental, podiatry, pharmacy, optometric, and nursing students, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Allied Health Professions Personnel Training Act of 1966".

Allied Health Professions Personnel Training Act of 1966.

ADDITION OF PART G TO TITLE VII OF THE PUBLIC HEALTH SERVICE ACT

SEC. 2. Title VII of the Public Health Service Act is amended by adding at the end thereof the following new part:

42 USC 292-295g.

"PART G—TRAINING IN THE ALLIED HEALTH PROFESSIONS

"GRANTS FOR CONSTRUCTION OF TEACHING FACILITIES FOR ALLIED HEALTH PROFESSIONS PERSONNEL

"Authorization of Appropriations

"SEC. 791. (a) (1) There are authorized to be appropriated for grants to assist in the construction of new facilities for training centers for allied health professions, or replacement or rehabilitation of existing facilities for such centers, $3,000,000 for the fiscal year ending June 30, 1967; $9,000,000 for the fiscal year ending June 30, 1968; and $13,500,000 for the fiscal year ending June 30, 1969.

80 STAT. 1222
80 STAT. 1223

"(2) Sums appropriated pursuant to paragraph (1) for a fiscal year shall remain available for grants under this section until the close of the next fiscal year.

"Approval of Applications for Construction Grants

"(b) (1) No application for a grant under this section may be approved unless it is submitted to the Surgeon General prior to July 1, 1968. The Surgeon General may from time to time set dates (not earlier than the fiscal year preceding the year for which a grant is sought) by which applications for grants under this section for any fiscal year must be filed.

"(2) A grant under this section may be made only if the application therefor is approved by the Surgeon General upon his determination that—

"(A) the applicant is a public or nonprofit private training center for allied health professions;

"(B) the application contains or is supported by reasonable assurances that (i) for not less than ten years after completion of construction, the facility will be used for the purposes of the training for which it is to be constructed, and will not be used for sectarian instruction or as a place for religious worship, (ii) sufficient funds will be available to meet the non-Federal share of the cost of constructing the facility, (iii) sufficient funds will be available, when construction is completed, for effective use of the facility for the training for which it is being constructed, and (iv) in the case of an application for a grant for construction to expand the training capacity of a training center for allied health professions, for the first full school year after the completion of the construction and for each of the nine years thereafter, the enrollment of full-time students at such center will exceed the highest enrollment of such students at such school for any of the five full school years preceding the year in which the application is made by at least 5 per centum of such highest enrollment, and the requirements of this clause (iv) shall be in addition to the requirements of section 792(b)(2), where applicable;

"(C)(i) in the case of an application for a grant for construction of a new facility, such application is for aid in the construction of a new training center for allied health professions, or construction which will expand the training capacity of an existing center, or (ii) in the case of an application for a grant for replacement or rehabilitation of existing facilities, such application is for aid in construction which will replace or rehabilitate facilities of an existing training center for allied health professions which are so obsolete as to require the center to curtail substantially either its enrollment or the quality of the training provided;

80 STAT. 1223

80 STAT. 1224

"(D) the plans and specifications are in accordance with regulations relating to minimum standards of construction and equipment; and

"(E) the application contains or is supported by adequate assurance that any laborer or mechanic employed by any contractor or subcontractor in the performance of work on the construction of the facility will be paid wages at rates not less than those prevailing on similar construction in the locality as determined by the Secretary of Labor in accordance with the Davis-Bacon Act, as amended (40 U.S.C. 276a–276a5). The Secretary of Labor shall have, with respect to the labor standards specified in this subparagraph (E), the authority and functions set forth in Reorganization Plan Numbered 14 of 1950 (15 F.R. 3176; 64 Stat. 1267), and section 2 of the Act of June 13, 1934, as amended (40 U.S.C. 276c).

49 Stat. 1011;
78 Stat. 238.
63 Stat. 108.

"(3) Notwithstanding paragraph (2), in the case of an affiliated hospital, an application which is approved by the training center for allied health professions with which the hospital is affiliated and which otherwise complies with the requirements of this section, may be filed by any public or other nonprofit agency qualified to file an application under section 605.

78 Stat. 453.

42 USC 291e.

"(4) In the case of any application, whether filed by a training center or, in the case of an affiliated hospital, by any other public or other nonprofit agency, for a grant under this section to assist in the construction of a facility which is a hospital or part of a hospital, as defined in section 625, only that portion of the project which the Surgeon General determines to be reasonably attributable to the need of such training center for the project for teaching purposes or in order to expand its training capacities or in order to prevent curtailment of enrollment or quality of training, as the case may be, shall be regarded as the project with respect to which payments may be made under this section.

42 USC 291o.

"(5) In considering applications for grants, the Surgeon General shall take into account—

"(A) the extent to which the project for which the grant is sought will aid in increasing the number of training centers for allied health professions providing training in three or more of the curriculums which are specified in or pursuant to paragraph (1)(A) of section 795 and are related to each other to the extent prescribed in regulations;

"(B)(i) in the case of a project for a new training center for allied health professions or for expansion of the facilities of an existing center, the relative effectiveness of the proposed facilities in expanding the capacity for the training of students in the allied health professions involved and in promoting an equitable geographical distribution of opportunities for such training (giving due consideration to population, relative unavailability of allied health professions personnel of the kinds to be trained by such center, and available resources in various areas of the Nation for training such personnel); or

80 STAT. 1224
80 STAT. 1225

"(ii) in the case of a project for replacement or rehabilitation of existing facilities of a training center for allied health professions, the relative need for such replacement or rehabilitation to prevent curtailment of the center's enrollment or deterioration of the quality of the training provided by the center, and the relative size of any such curtailment and its effect on the geographical distribution of opportunities for training in the allied health professions involved (giving consideration to the factors mentioned above in subparagraph (i)); and

"(C) in the case of an applicant in a State which has in existence a State or local area agency involved in planning for facilities for the training of allied health professions personnel, or which participates in a regional or other interstate agency involved in planning for such facilities, the relationship of the application to the construction or training program which is being developed by such agency or agencies and, if such agency or agencies have reviewed such application, any comment thereon submitted by them.

"Amount of Construction Grant; Payments

"(c)(1) The amount of any grant for a construction project under this section shall be such amount as the Surgeon General determines to be appropriate; except that (A) in the case of a grant for a project for a new training center for allied health professions, and in the case of a grant for a project for new facilities for an existing center where such facilities are of particular importance in providing a major expansion of the training capacity of such center, as determined in accordance with regulations, such amount may not exceed 66⅔ per centum of the necessary cost of construction, as determined by the Surgeon General, of such project; and (B) in the case of any other grant, such amount may not exceed 50 per centum of the necessary cost of construction, as so determined, of the project with respect to which the grant is made.

"(2) Upon approval of any application for a grant under this section, the Surgeon General shall reserve, from any appropriation available therefor, the amount of such grant as determined under paragraph (1); the amount so reserved may be paid in advance or by way of reimbursement, and in such installments consistent with construction progress, as the Surgeon General may determine. The Surgeon General's reservation of any amount under this subsection may be amended by him, either upon approval of an amendment of the application or upon revision of the estimated cost of construction of the facility.

"(3) In determining the amount of any grant under this section, there shall be excluded from the cost of construction an amount equal to the sum of (A) the amount of any other Federal grant which the applicant has obtained, or is assured of obtaining, with respect to the construction which is to be financed in part by the grant under this section, and (B) the amount of any non-Federal funds required to be expended as a condition of such other Federal grant.

"Recapture of Payments

"(d) If, within ten years after completion of any construction for which funds have been paid under this section—

"(1) the applicant or other owner of the facility shall cease to be a public or nonprofit private training center for allied health professions, or

"(2) the facility shall cease to be used for the training purposes for which it was constructed (unless the Surgeon General determines, in accordance with regulations, that there is good cause for releasing the applicant or other owner from the obligation to do so), or

"(3) the facility is used for sectarian instruction or as a place for religious worship,

the United States shall be entitled to recover from the applicant or other owner of the facility the amount bearing the same ratio to the then value (as determined by agreement of the parties or by action brought in the United States district court for the district in which such facility is situated) of the facility, as the amount of the Federal participation bore to the cost of construction of such facility.

"GRANTS TO IMPROVE THE QUALITY OF TRAINING CENTERS FOR ALLIED HEALTH PROFESSIONS

"Authorization of Appropriations

"SEC. 792. (a) There are authorized to be appropriated $9,000,000 for the fiscal year ending June 30, 1967; $13,000,000 for the fiscal year ending June 30, 1968; and $17,000,000 for the fiscal year ending June 30, 1969; for grants under this section to assist training centers for allied health professions to develop new or improved curriculums for training allied health professions personnel and otherwise improve the quality of their educational programs.

"Basic Improvement Grants

"(b)(1) Subject to the provisions of paragraph (2), the Surgeon General may, for each fiscal year in the period beginning July 1, 1966, and ending June 30, 1969, make to each training center for allied health professions whose application for a basic improvement grant has been approved by him a grant equal to the product obtained by multiplying $5,000 by the number of curriculums specified in or pursuant to paragraph (1)(A) of section 795 in which such center provides training during such year, plus the product obtained by multiplying $500 by the number of full-time students in such center receiving training in such curriculums.

"(2) The Surgeon General shall not make a grant under this subsection to any center unless the application for such grant contains or is supported by reasonable assurances that for the first school year beginning after the fiscal year for which such grant is made and each school year thereafter during which such a grant is made the enrollment of full-time students at such center will exceed the highest enrollment of such students in such center for any of the five school years during the period July 1, 1961, through July 1, 1966, by at least 2½ per centum of such highest enrollment, or by three students whichever is greater. The requirements of this paragraph shall be in addition to the requirements of section 791(b)(2)(B)(iv) of this Act, where applicable. The Surgeon General is authorized to waive (in whole or in part) the provisions of this paragraph if he determines that the required increase in enrollment of full-time students in a center cannot, because of limitations of physical facilities available to the center for training, be accomplished without lowering the quality of training for such students.

"Special Improvement Grants

"(c)(1) From the sums appropriated under subsection (a) for any fiscal year and not required for making grants under subsection (b), the Surgeon General may make an additional grant for such year to any training center for allied health professions which has an approved application therefor and for which an application has been approved under subsection (b), if he determines that the requirements of paragraph (2) are satisfied in the case of such applicant.

"(2) No special improvement grant shall be made under this section unless (A) the Surgeon General determines that such grant will be utilized by the recipient training center to contribute toward provision, maintenance, or improvement of specialized function which the center serves, and (B) such center provides or will, with the aid of grants under this part, within a reasonable time provide training in not less than three of the curriculums which are specified in or pursuant to paragraph (1)(A) of section 795 and are related to each other to the extent prescribed in regulations.

"(3) No grant to any center under this subsection may exceed $100,000 for any fiscal year.

"Application for Grants

"(d)(1) The Surgeon General may from time to time set dates (not earlier than in the fiscal year preceding the year for which a grant is sought) by which applications for basic or special improvement grants under this section for any fiscal year must be filed.

"(2) A grant under this section may be made only if the application therefor is approved by the Surgeon General upon his determination that—

"(A) it contains or is supported by assurances satisfactory to the Surgeon General that the applicant is a public or nonprofit private training center for allied health professions and will expend in carrying out its functions as such a center, during the fiscal year for which such grant is sought, an amount of funds (other than funds for construction as determined by the Surgeon General) from non-Federal sources which are at least as great as the average amount of funds expended by such applicant for such purpose in the three fiscal years immediately preceding the fiscal year for which such grant is sought;

"(B) it contains such additional information as the Surgeon General may require to make the determinations required of him under this section and such assurances as he may find necessary to carry out the purposes of this section; and

"(C) it provides for such fiscal control and accounting procedures and reports, and access to the records of the applicant, as the Surgeon General may require to assure proper disbursement of and accounting for Federal funds paid to the applicant under this section.

"(3) In considering applications for grants under subsection (c), the Surgeon General shall take into consideration the relative financial need of the applicant for such a grant and the relative effectiveness of the applicant's plan in carrying out the purposes of such grants, and in contributing to an equitable geographical distribution of training centers offering high-quality training of allied health professions personnel.

"TRAINEESHIPS FOR ADVANCED TRAINING OF ALLIED HEALTH PROFESSIONS PERSONNEL

"SEC. 793. (a) There are authorized to be appropriated $1,500,000 for the fiscal year ending June 30, 1967; $2,500,000 for the fiscal year ending June 30, 1968; and $3,500,000 for the fiscal year ending June 30, 1969; to cover the cost of traineeships for the training of allied health professions personnel to teach health services technicians or in any of the allied health professions, to serve in any of such professions in administrative or supervisory capacities, or to serve in allied health professions specialties determined by the Surgeon General to require advanced training.

"(b) Traineeships under this section shall be awarded by the Surgeon General through grants to public or nonprofit private training centers for allied health professions.

"(c) Payments to centers under this section may be made in advance or by way of reimbursement, and at such intervals and on such conditions, as the Surgeon General finds necessary. Such payments may be used only for traineeships and shall be limited to such amounts as the Surgeon General finds necessary to cover the costs of tuition and fees, and a stipend and allowances (including travel and subsistence expenses) for the trainees.

"DEVELOPMENT OF NEW METHODS

"SEC. 794. There are authorized to be appropriated $750,000 for the fiscal year ending June 30, 1967; $2,250,000 for the fiscal year ending June 30, 1968; and $3,000,000 for the fiscal year ending June 30, 1969; for grants to public or nonprofit private training centers for allied health professions for projects to develop, demonstrate, or evaluate curriculums for the training of new types of health technologists.

"DEFINITIONS

"SEC. 795. For purposes of this part—

"(1) The term 'training center for allied health professions' means a junior college, college, or university—

"(A) which provides, or can provide, programs of education leading to a baccalaureate or associate degree or to the equivalent of either or to a higher degree in the medical technology, optometric technology, dental hygiene, or any of such other of the allied health professions curriculums as are specified by regulations, or which, if in a junior college provides a program (i) leading to an associate or an equivalent degree, (ii) of education in medical technology, optometric technology, dental hygiene, or any of such other of the allied health technical or professional curriculums as are specified by regulation, and (iii) acceptable for full credit toward a baccalaureate or equivalent degree in the allied health professions or designed to prepare the student to work as a technician in a health occupation specified by regulations of the Surgeon General,

"(B) which provides training for not less than a total of twenty persons in such curriculums, "(C) which, if in a college or university which does not include a teaching hospital or in a junior college, is affiliated (to the extent and in the manner determined in accordance with regulations) with such a hospital,

"(D) which is (or is in a college or university, which is) accredited by a recognized body or bodies approved for such purpose by the Commissioner of education, or which is in a junior college which is accredited by the regional accrediting agency for the region in which it is located or there is satisfactory assurance afforded by such accrediting agency to the Surgeon General that reasonable progress is being made toward accreditation by such junior college, and

"(E) in the case of an applicant for a grant under section 793, which, if the college or university does not include a school of medicine, a school of osteopathy, school of optometry, or school of dentistry, as defined in paragraph (4) of section 724, as may be appropriate in the light of the training for which the grant is to be made, is affiliated (to the extent and in the manner determined in accordance with regulations) with such a school, 77 Stat. 169. 42 USC 293d.

except that an applicant for a grant for a construction project under section 791 which does not at the time of application meet the requirement of clause (B) shall be deemed to meet such requirement if the Surgeon General finds there is reasonable assurance that the unit will meet the requirement of clause (B) prior to the beginning of the academic year following the normal graduation date of the first entering class in such unit, or, if later, upon completion of the project for which assistance is requested and other projects (if any) under construction or planned and to be commenced within a reasonable time.

"(2) The term 'full-time student' means a student pursuing a full-time course of study, in one of the curriculums specified in or pursuant to paragraph (1)(A) of this section, leading to a baccalaureate or associate degree or to the equivalent of either, or to a higher degree, in a training center for allied health professions; regulations of the Surgeon General shall include provisions relating to determination of the number of students enrolled at a training center on the basis of estimates, or on the basis of the number of students enrolled in a training center in an earlier year, or on such basis as he deems appropriate for making such determination, and shall include methods of making such determinations when a training center was not in existence in an earlier year.

"(3) The term 'nonprofit' as applied to any training center for allied health professions means one which is a corporation or association, or is owned and operated by one or more corporations or associations, no part of the net earnings of which inures, or may lawfully inure, to the benefit of any private shareholder or individual.

"(4) The terms 'construction' and 'cost of construction' include (A) the construction of new buildings, and the acquisition, expansion, remodeling, replacement, and alteration of existing buildings, including architects' fees, but not including the cost of acquisition of land (except in the case of acquisition of an existing building), off-site improvements, living quarters, or patient-care facilities, and (B) equipping new buildings and existing buildings, whether or not expanded, remodeled, or altered.

"(5) The term 'affiliated hospital' means a hospital, as defined in section 625, which is not owned by, but is affiliated (to the extent and in the manner determined in accordance with regulations) with, one or more training centers for allied health professions. 78 Stat. 460. 42 USC 291o.

Pub. Law 89-751 November 3, 1966
80 STAT. 1230

"RECORDS AND AUDIT

"SEC. 796. (a) Each recipient of a grant under this part shall keep such records as the Surgeon General may prescribe, including records which fully disclose the amount and disposition by such recipient of the proceeds of such grant, the total cost of the project or undertaking in connection with which such grant is made or used, and the amount of that portion of the cost of the project or undertaking supplied by other sources, and such records as will facilitate an effective audit.

"(b) The Secretary of Health, Education, and Welfare and the Comptroller General of the United States, or any of their duly authorized representatives, shall have access for the purpose of audit and examination to any books, documents, papers, and records of the recipient of any grant under this part which are pertinent to any such grant."

PARTNERSHIP FOR HEALTH AMENDMENTS OF 1967

Pub. Law 90-174 December 5, 1967
81 STAT. 542

***

MINOR OR TECHNICAL AMENDMENTS

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Sec. 12. (e) Section 795(1)(A)(ii) of such Act* is amended to read as follows: "(ii) of education in optometric technology, dental hygiene, or curriculums as are specified by regulation, and".

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*Public Health Service Act

TITLE III—ALLIED HEALTH PROFESSIONS AND PUBLIC HEALTH TRAINING

EXTENSION AND IMPROVEMENT OF ALLIED HEALTH PROFESSIONS PROGRAM

Appropriations.
80 Stat. 1222.

SEC. 301. (a)(1)(A) Section 791(a)(1) of the Public Health Service Act (42 U.S.C. 295h) is amended by striking out "and $13,500,000 for the fiscal year ending June 30, 1969" and inserting in lieu thereof "$13,500,000 for the fiscal year ending June 30, 1969; and $10,000,000 for the fiscal year ending June 30, 1970".

(B) Section 791(b)(1) of such Act is amended by striking out "1968" and inserting in lieu thereof "1969".

(2)(A) Section 792(a) of such Act (42 U.S.C. 295h-1) is amended by striking out "and $17,000,000 for the fiscal year ending June 30, 1969" and inserting in lieu thereof "$17,000,000 for the fiscal year ending June 30, 1969; and $20,000,000 for the fiscal year ending June 30, 1970".

(B) Section 792(b)(1) of such Act is amended by striking out "1969" and inserting in lieu thereof "1970".

(3) Section 793(a) of such Act (42 U.S.C. 295h-2) is amended by striking out "and $3,500,000 for the fiscal year ending June 30, 1969" and inserting in lieu thereof "$3,500,000 for the fiscal year ending June 30, 1969; and $5,000,000 for the fiscal year ending June 30, 1970".

(4) Section 794 of such Act (42 U.S.C. 295h-3) is amended by striking out "and $3,000,000 for the fiscal year ending June 30, 1969" and inserting in lieu thereof "$3,000,000 for the fiscal year ending June 30, 1969; and $4,500,000 for the fiscal year ending June 30, 1970".

(b) Such section 794 is further amended by—

(1) striking out "training centers for allied health professions" and inserting in lieu thereof "agencies, institutions, and organizations";

(2) inserting "and methods" after "curriculums"; and

(3) striking out "new types of".

(c) Part G of title VII of such Act is further amended by adding at the end thereof the following new section:

"EVALUATION

"SEC. 797. Such portion of any appropriation pursuant to section 791, 792, 793, or 794, for any fiscal year ending after June 30, 1969, as the Secretary may determine, but not exceeding one-half of 1 per centum thereof, shall be available to the Secretary for evaluation (directly or by grants or contracts) of the programs authorized by this part."

(d) Such part G is further amended by adding after section 797 (added by subsection (c)) the following new section:

"STUDY

Report to
President and
Congress.

"SEC. 798. The Secretary shall prepare, and submit to the President and the Congress prior to April 1, 1969, a report on the administration of this part, an appraisal of the programs under this part in the light of their adequacy to meet the needs for allied health professions personnel, and his recommendations as a result thereof."

Appendix B

Factors Related to the Need for Environmental Health Manpower

Appendix B

Factors Related to the Need for Environmental Health Manpower[1]

Our Deteriorating Environment

The transformation of the United States from an agrarian to an industrial society in less than a century is a singular accomplishment in man's history. The result has been the affluent society with its steadily rising standard of living for a steadily increasing proportion of our population. Significantly, more people—both in absolute numbers and as a percentage of the total population—today own more homes, drive more automobiles, consume more goods and services, receive a higher level of education, and enjoy more leisure time than was the case just a quarter of a century earlier.

Yet, in accomplishing this feat, man has behaved for the most part as though he and his actions were exempt from the natural laws that govern his ecosystem. He has used his resources as though he could heedlessly exploit, contaminate, and alter the world about him without upsetting the stability of the ecosystem of which he is a part. So long as his numbers were small, and his impact on the environment remained limited and localized, man did not have to pay the price for his shortsightedness.

But history has changed all that. Human population has soared. Almost incredible advances in science and technology have given man new and awesome power to alter—and even destroy—his environment. The waste products of his technology and of his own biological processes have grossly polluted the land, air, and water. Moreover, 20th-century man is discovering that his basic social and psychological drives are increasingly frustrated by pressures of the artificial, urbanized world of his own making.

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[1] Prepared by the Consumer Protection and Environmental Health Service, Public Health Service, U.S. Department of Health, Education, and Welfare.

Condemned by the literature are pollution of the air, water, soil, and food * * * occupational and commuter stresses * * * noises * * * vibrations * * * inadequate housing and work environments * * * hazards on the highways, in the home, and beneath the streets * * * social and interpersonal tensions * * * all packaged up under the title of environmental health.

The following are examples of environmental health problems that demand attention:

- Toxic matter is being released into the air over the United States at a rate of more than 142 million tons a year, or three-quarters of a ton for every American. It comes from 90 million motor vehicles, from factories, power plants, municipal dumps, and backyard incinerators.
- The use of food additives to impart flavor, color, or other qualities has increased 50 percent in the past 10 years, and each of us now consumes an average of 3 pounds of these chemicals yearly. Pesticides leave residues on food crops, and traces of veterinary drugs occur in meat, milk, and eggs—all this in addition to the chemical barrage that reaches us from other parts of the environment.
- Over 2 million Americans are stricken with illness each year from microbiological contamination of food; increased use of "convenience" foods requiring little or no heating in the home complicates this problem.
- Not counting industrial and agricultural wastes, we discard more than 165 million tons of solid wastes every year. Auto graveyards mar our landscapes; smoking, foul-smelling dumps pollute the air; no-return bottles, cans, and other packaging that cannot be recycled create mountains of trash. In low-income urban areas, garbage breeds rats, disease, and filth.
- Every year more than 500 new chemicals and chemical compounds are introduced into industry, along with countless operational innovations. Thousands of workers suffer from cancer, lung disease, hearing loss, dermatitis, or other preventable diseases because industry, unions, and government at all levels have failed to give really adequate attention to occupational hazards.
- The quality of much of the drinking water available in our Nation's communities is unknown. About 58 million persons in over 19,000 communities are served with water supplies which are not covered by U.S. Public Health Service standards; approximately 92 million people are served by 750 supplies which are covered by these standards. Parenthetically, it should be noted that the U.S. Public Health Service drinking water standards need to be updated, particularly with regard to chemical contaminants.
- Accidents, many of them involving hazardous products, take the lives of 100,000 Americans every year and injure 52 million more. Some 3,000 deaths occur every year from accidental ingestion of poisons—most of these among children.
- Radiation as an environmental hazard is a growing threat to ours and future generations which we have barely begun to understand. Radiation sources are now to be found throughout the environment. They range

from the large-scale applications of nuclear energy, particularly in electric power generation, through laser and microwave technology in industry, to the use of radionuclides and X-rays in the healing arts and the use of microwave ovens and other electronic equipment in the home. And our scientific protection against radiation is at a beginning state of development.

- The world clamors for the thousands of new miracle drugs which our pharmaceutical research produces to treat specific disease problems. Yet in spite of our best efforts at testing, labeling, and other controls, they often produce unforeseen side effects and may even offer sinister genetic threats.

Effects on Man

Our concern is for health in its broadest context—in the words of the World Health Organization definition—"a state of complete physical, mental, and social well-being, not merely the absence of disease or infirmity." Environmental health, then, focuses on man—the whole man—and on the mix of biological, physical, and psychosocial factors which individually and collectively influence his survival and growth—with the equal emphasis on the quality of living and on the status of physical health. It not only extends beyond considerations of disease but extends in time over the whole life of an individual and to the genetic effects which would appear in subsequent generations.

Man's environment really is a multi-environment system which encompasses the physical and biotic realms as well as the cultural setting fashioned by his usual cerebral capabilities. Thus, we can view man, the organism, relating simultaneously to the biophysical and to the sociocultural components of his environment. The interrelations between total man and his total environment are dynamic. Each makes, and responds to, aggressions on the other.

The ability of the human organism to maintain internal integrity in the face of external forces is one which is *past* oriented. Until now, the regulatory mechanisms to achieve homeostatsis were genetically linked to a period of man's evolutionary history quite unlike that which he faces today. In this era of rapid change, there is no longer time for leisurely adaption and evolution. Presently, man-induced, drastic alterations and disturbances in his total environment are resulting in insults, excitants, and stressors which necessarily evoke physiological, morphological, behavioral, and/or social responses from the human organism. Thus, through synergism or potentiation, an individually acceptable amount of water pollution, added to a tolerable amount of air pollution, combined with a bearable amount of noise and congestion can produce a totally unacceptable health environment. Dr. René Dubos of the Rockefeller University, an authority on human ecology, recently stated it thus: "In the long run, the most important aspect of human ecology is that all environmental factors exert a direct influence on human characteristics, in health as well as in disease. In fact, it can be said that the body and the mind are shaped by the adaptive responses that man makes to the physiochemical, social, behavioral, and even historical stimuli that impinge on him * * *."

Dr. Dubos has said also that "the general state of public health has greatly improved during the past century, but therapeutic procedures have played a relatively small role in this achievement. Advances in health and in the expectancy of life have come chiefly from higher standards of living, and from the application of natural sciences to the *prevention* of infectious and nutritional diseases." Environmental health programs can continue the important precedent that was established in the prevention of infectious diseases. The diseases most characteristic of our time result in large part from economic affluence, pollution, and high-population densities, although they have different ecologic determinants. For example, the increase in chronic and degenerative diseases is due in part at least to the environmental and behavioral changes resulting from industrialization and urbanization.

Successful environmental control programs too have great potential for reducing the drain on national resources represented by present and future demands for health services. For example, in 1966, bacterial, parasitic, and digestive illness, largely susceptible to control by proper environmental management, cost this Nation nearly 1 billion disability days. Injuries increased this loss by one-third and reduced productive workdays by 88 million in 1966, while adding 22 million bed-days to the load on hospitals. The tangible economic loss from accidents has been estimated at $18 billion per year. The cost in productive capacity alone for the nonaccident disability days was in the range of $8 billion. Environmental controls and preventive practices might well reduce this annual loss by one-half.

Equally susceptible to significant reduction through control of environmental hazards are chronic diseases, particularly emphysema, chronic bronchitis, lung cancer, and asthma—which are the fastest rising causes of death and disability in the Nation. Air pollution, for example, takes a rising toll in more cities each year—in economic loss, in reduced productivity, and in health care required for illness induced or aggravated by increasing pollution.

Conservation of manpower resources in dentistry can be aided by environmental controls also. The practice of universal fluoridation of water supplies could more effectively, rapidly, and inexpensively reduce caries incidence among all children, not just those whose parents invest in topical application or a medicated toothpaste.

Response to the Problem

In response to public concern, recent attention has been directed to problems concerned with environmental quality by both the executive and legislative branches of the Federal Government. For example, in July 1968, the House of Representatives and the Senate jointly sponsored a colloquium to discuss a national policy for the environment. In the first session of the 91st Congress, a bill has been introduced which would set up a Council of Ecological Advisers, and a resolution has been offered in the Senate which would authorize the formation of a Select Committee on Technology and the Human Environment. In the executive branch, recent activities include such comprehensive reports as: (1) The "Report of the Surgeon General's Committee on Environmental Health Problems"; (2) the report of the National Academy of Sciences-National Research

Council, "Waste Management and Control"; (3) the report of the President's Science Advisory Committee, "Restoring the Quality of Our Environment"; and (4) the report of the HEW Secretary's Task Force on Environmental Health and Related Problems, "A Strategy for a Livable Environment." Mention should also be made of the ongoing Committee on Environmental Quality of the Federal Council on Science and Technology. Importantly, the Consumer Protection and Environmental Health Service has now been established within the Department of Health, Education, and Welfare to serve as the lead agency primarily concerned with health hazards in man's environment. In assuming this lead role the Service recently sponsored a national interdisciplinary symposium on human ecology, which brought together leaders from the public and private sectors to share viewpoints regarding man-environment relationships.

In recent years the Federal Government increasingly has assumed a leadership role in environmental health, primarily through the enactment of categorical legislation. There are indications that this leadership role will encompass the comprehensive elements which are essential to more rational solutions to the complex problems of the environment. The concern and action at the Federal level has been reflected at State and local levels by new and renewed interest in environmental health. Recognizing that the control of environmental hazards rests primarily with State and local governments, new categorical programs have been established at these levels of governments.

Similarly, the private sector is showing response to the challenges of environmental health. In some instances this response is resulting from enlightened leadership within business and industry; in other instances actions in the private sector are resulting solely in compliance with governmental control programs.

Importantly, it should be noted that these responses are the result of increasing public concern for a healthy environment. An enlightened public, as individual citizens and as members of community organizations, is demanding action at all levels of government and from the private sector as well. They recognize the implications of a deteriorated environment in terms of their physical health as well as in terms of the quality of life that each American should be able to enjoy.

Look to the Future

As environmental problems become even more complex and serious in light of increasing population, urbanization, and advances in technology, any look to the future must predict that the need for a healthful environment will be even of greater importance to the Nation—both in terms of the national interest and in terms of public demand. Concurrently, there will be need for the commitment of far greater resources to the effective solution of these problems, if this Nation is to continue to thrive—and perhaps survive. It is obvious that a significant increase in trained manpower will be required to carry out effective environmental health programs in both the public and private sectors.

There is an urgent need to increase the supply of trained manpower in four areas:

(1) Scientists in a greater variety of disciplines are needed if essential *research and development* activities are to be carried forward.

(2) High-caliber personnel are required for the task of *program planning and development*. In this area the emphasis will be on the demand for broadly trained personnel from a variety of disciplines, knowledgeable in both the physical and social sciences and capable of combining design with the practical demands of public policy making.

(3) Environmental health *administrators* and scientific and technical *specialists* will be essential if governmental programs are to be effectively implemented. Regardless of our scientific understanding of environmental mechanisms and how to control them, and regardless of how well environmental protection programs are planned, environmental quality objectives will never be reached unless there is an adequate supply of qualified personnel to direct and carry out control programs.

(4) There is need for a variety of environmental *technicians and aides* who are prepared to assist professional personnel in carrying out effective programs.

The field of environmental health requires practitioners at all levels who differ widely in their special skills and understanding. The field includes a wide range of individuals with backgrounds in the physical and biomedical sciences, in mathematics, and in the social sciences. In the physical sciences, representation extends from classical physics and chemistry through meteorology and radiation physics to hydrology, oceanography, and engineering. In the biomedical sciences, requirements extend from molecular biology, botany, and microbiology through biochemistry, pharmacology, and radiobiology to epidemiology, toxicology, and the several medical specialties. Added to these are manpower requirements in mathematics, statistics, sociology, anthropology, political science, economics, and psychology.

Education for Environmental Health Services

The present pool of environmental health manpower is composed largely of: (1) personnel in many professions who have *basic disciplinary education*, some of which may include environmental health subject matter; (2) professional personnel with postgraduate education in environmental health, in *categorical-program* fields (air pollution, water pollution, etc.); and (3) personnel with *other post-high school preparation*. A majority of professional manpower enter the pool with basic education in some related discipline, not in environmental health. Education in general and specific environmental health program areas is provided most often at the postgraduate level.

There is urgent need for truly interdisciplinary approaches to manpower preparation, using human ecology as a point of synthesis. The need to orient general education to an ecological theme—at a faster pace—defines the manpower development problem. Traditionally, our universities have been the heart of the advancement of knowledge in the separate disciplines. The concept of general education should be modified so that it includes the contributions of all appropriate elements to the educational process; an increased collaboration among academic components through the sharing of commonly used concepts and techniques and the application of those concepts and techniques to the real problems of society; and the greater use of professional and public offerings at the continuing education level.

Management of the environment obviously requires specialists of all kinds. *Effective* management of the environment requires not only a working knowledge of a wide range of sciences but developed aptitudes in their application. No matter how technically competent the practitioner may be, he is less effective unless he can interpret and meet the needs of people. The value of *"horizontal wisdom"*—broad understanding of social problems and methods of attack—should receive emphasis equal to that of *"vertical precision"*—thorough understanding of technical problems in the field.

There is a continuing need to train substantial numbers of environmental specialists capable of developing and applying the technologies necessary for modifying, restoring, and maintaining the environment in accord with goals and objectives. These specialists would contribute more effectively to the desired unification of concepts and practices concerned with environmental quality if their education and experience incorporated the opportunity to comprehend both the health and health-related aspects and the interdisciplinary demands of environmental problems, and if they acquired the ability to communicate and work with the other specialists in the field.

Innovation is needed on the part of the academic community for the preparation of environmental health manpower. One such approach could be the "academic center," defined as an educational and research entity within a university comprising a company of teachers, investigators, and students who become associated because of a common scholarly and professional concern with the study and control of the multifaceted interaction of man with his environment. Centers for environmental health would call for an association of interested scholars from many disciplines, committed to creating and implementing an innovative, coherent plan for producing knowledge, for training people, and for educating the public—all to the end of managing and improving the quality of man's environment.

A center could concern itself primarily with a basic subject such as toxicology; it could focus on a single categorical problem such as air or water pollution; it could concentrate on the comprehensiveness associated with environmental pollution or environmental health generally. Intellectually, attack on any aspect of the vast problem of manpower needs in environmental health could be equally exciting and challenging. What is sought is the preparation of manpower capable of imaginative, creative approaches and solutions to complex environmental problems.

Appendix C

Appendix Tables

APPENDIX C

Table C-1. Educational Programs for Selected Medical Allied Occupations for Which the Appropriate Requirement for Basic Occupational Preparation Is at Least Baccalaureate, and Number of Graduates: 1965 through 1968

Occupation	Educational program	Programs				Graduates			
		1965	1966	1967	1968	1965	1966	1967	1968
Administration:									
Health administrator	Public health administration [1]	14		15		92		98	
	Hospital administration	17	18	21	24	297		376	
Program analyst									
Program representative									
Systems analyst	Computer science and systems analysis [2]					239		346	
Biomedical Engineering:									
Biomedical engineer	Biomedical engineering [3]			20					
Clinical Laboratory Services:									
Laboratory scientist									
Laboratory technologist	Medical technology [4,5]	781	773	786	787	3,065	3,460	3,845	3,855
Dietetic and Nutritional Services:									
Dietitian	Dietetic internship	63	64	64		670	734	696	
	Foods and nutrition (home economics) [2]		40			131	132		
	Institution management (home economics) [2]		6			29	24		
Nutritionist	Public health nutrition [1]	14	14	14		73	70	86	
	Nutrition (biological sciences)		25			112	142		
Health Education:									
Health educator	Public health education [1]	10	10	10	10	112	103	100	108
	Health education specialization			78				2,728	
Medical Record Services:									
Medical record librarian	Medical record science [4,5]	29	28	28	27	180	192	192	151
Occupational Therapy:									
Occupational therapist	Occupational therapy [4]	32	32	32	32	505	485	536	
Physical Therapy:									
Physical therapist	Physical therapy [4]	42	43	48	48	890	936	1,005	

Occupation	Educational program	Programs				Graduates			
		1965	1966	1967	1968	1965	1966	1967	1968
Radiologic Technology:									
Radiologic technologist									
Specialized Rehabilitation Services:									
Corrective therapist	Trainees in VA hospitals	72		63		129		113	
Educational therapist	do	15		18		10		11	
Manual arts therapist	do	51		46		56		53	
Music therapist	Music therapy	11	11	12	13	99	104	116	126
Recreation therapist	Trainees in VA hospitals [6]	39		37		28		10	
Homemaking rehabilitation consultant	do					16	12	12	
Speech Pathology and Audiology:									
Speech pathologist	Speech pathology and audiology	240	247	271		3,688	4,716	5,864	
Audiologist									
Vision Care:									
Vision care technologist									
Miscellaneous Health Services:									
Physician's associate									
Extracorporeal circulation specialist									

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[1] Programs in schools of public health.

[2] Graduates may be employed in health and other fields.

[3] Includes some programs at baccalaureate level.

[4] AMA approved programs.

[5] Includes programs at baccalaureate level or below.

[6] Includes music therapy.

Table C-2. Educational Programs for Selected Medical Allied Occupations for Which the Appropriate Requirement for Basic Occupational Preparation Is Less Than Baccalaureate, and Number of Graduates: 1965 through 1968

Occupation	Programs [1]				Graduates			
	1965	1966	1967	1968	1965	1966	1967	1968
Biomedical Engineering:								
Biomedical engineering technician	...	...	...	...				
Biomedical engineering aide	...	...	...	...				
Clinical Laboratory Services:								
Clinical laboratory technician:								
Cytotechnologist [2]	84	92	98	109	332	325	348	368
Clinical laboratory aide:								
Certified laboratory assistant [2]	83	115	148	...	467	...	[3] 1,100	
Dietetic and Nutritional Services:								
Dietary technician	...	...	36	51				
Dietary aide or food service supervisor	...	...	...	...				
Health Education:								
Health education aide	...	...	...	...				
Medical Record Services:								
Medical record technician [2]	13	15	12	14	70	105	93	70
Medical record clerk	...	...	...	...				
Occupational Therapy:								
Occupational therapy assistant	12	...	19	...	200	...	207	...
Occupational therapy aide	0	0	...	...				
Orthotic and Prosthetic Technology:								
Orthotist	3	...	4	...				
Prosthetist								
Orthotic aide	0	0	0	0				
Prosthetic aide	0	0	0	0				
Restoration technician	0	0	0	0				
Pharmacy:								
Pharmacy aide	0	0	...	...				
Physical Therapy:								
Physical therapy assistant	0	...	...	...				
Physical therapy aide	0	0	...	...				
Radiologic Technology:								
Radiologic technician [2]	901	968	1,072	1,126	3,057	4,175	4,939	4,767
Specialized Rehabilitation Services:								
Corrective therapy aide	0	0	...	...				
Recreation therapy aide	0	0	...	...				
Vision Care:								
Vision care technician—								
Ocular care technician	0	0	0	0				
Orthoptic technician	...	24	...	...	...	[3] 50	...	...
Optician	5	...	6	...	88	...	73	...
Visual care aide	0	0	0	0				

See footnotes at end of table.

Table C–2. Educational Programs for Selected Medical Allied Occupations for Which the Appropriate Requirement for Basic Occupational Preparation Is Less Than Baccalaureate, and Number of Graduates: 1965 through 1968—Continued

Occupation	Programs [1]				Graduates			
	1965	1966	1967	1968	1965	1966	1967	1968
Miscellaneous Health Services:								
Physician's assistant	0	0	....	....				
Physician's aide	0	....	....	....				
Community health aide	0	0	....	....				
Medical machine technician	....	....	....	....				
Biomedical equipment technician	....	....	....	....				
Cardiopulmonary technician	0	....	....	....				
Electrocardiograph technician	0	....	....	....				
Electroencephalograph technician	....	7	11	....				
Inhalation therapy technician	11	21	30	44	48	102	150	200
Inhalation therapy aide	0	0	0	0				
Medical emergency technician	0	0	....	....				
Ambulance attendant (aide)	0	0	0	0				

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[1] Inservice training of high school graduates for some of these occupations may be supplemented by newly developing programs in vocational or trade schools. The count of formal educational programs is recognized as being incomplete.

[2] AMA approved programs.

[3] Students; data on graduates not available.

Symbols: 0 no known programs; .... data not available but at least 1 program known.

Table C-3. Educational Programs for Dental Allied Occupations and Number of Graduates: 1965 through 1968

Occupation [1]	Educational programs				Graduates			
	1965	1966	1967	1968	1965	1966	1967	1968 [2]
Dental hygienist	53	56	58	67	1,491	1,650	1,739	1,800
Dental assistant	50	64	81	101	1,241	1,593	1,963	2,200
Dental technician	5	6	10	15	119	142	162	250

[1] Occupations for which the appropriate requirement for basic occupational preparation is less than baccalaureate.
[2] Public Health Service estimates.

Table C-4. Educational Programs Required for Dental Allied Occupations: 1975 and 1980

Educational programs and annual graduates	Dental hygienist		Dental assistant		Dental technician	
	1975	1980	1975	1980	1975	1980
Educational programs:						
Required	150	225	400	750	55	90
Expected	100	120	250	350	35	45
Deficit	50	105	150	400	20	45
Annual graduates:						
Required	5,000	7,500	12,000	21,000	1,300	2,200
Expected	3,300	3,900	7,500	10,500	900	1,100
Deficit	1,700	3,600	4,500	10,500	400	1,100

Appendix D

Project Remed

Appendix D

Project Remed

Project Remed is a program designed to encourage men and women who have received training in a health occupation, while on active duty in the Armed Forces, to seek employment in the health field when they return to civilian life. The Department of Defense, the Veterans Administration, the Department of Health, Education, and Welfare, and the Department of Labor are cooperating in this program.

A serviceman, while being counseled about civilian employment opportunities prior to his discharge from the armed services, registers his skills and military occupation on a form which is forwarded to the local U.S. Employment Office nearest his home.

The Veterans Administration provides the veteran with information about benefits for which he is eligible and employment opportunities in Veterans Administration hospitals. The local U.S. Employment Service Office in cooperation with State and local education agencies and employers of health personnel provides information on local education, training, and employment opportunities. In this manner, veterans with training and experience in health occupations are encouraged to seek civilian employment in the health field.

Theoretically, this should assist in alleviating critical manpower shortages in the allied health professions. There is only limited data available on the degree of success this project has achieved, and there are several factors which are limiting its effectiveness:

- Each uniformed service has established its own training programs to meet its own needs. In most instances the training programs do not meet eligibility requirements for certification, registration, and licensure required for civilian employment.
- The lack of equivalency examinations for persons desiring civilian employment in allied health occupations, for which they were trained in the

Armed Forces, makes it necessary for them to repeat the training to qualify for registration, certification, or licensure.

- The wage scale in many of the allied health categories is too low to interest a young man with family responsibilities.
- Many of the military trained health technicians and technologists do not desire to seek similar civilian employment.

The cooperation of professional groups, practitioners in the various health professions, educational institutions, treatment facilities, licensing boards, and those responsible for training health technicians and technologists in the military will be necessary to resolve these problems.

Appendix E

Assistants for Physicians

Appendix E

Assistants for Physicians

The concept of assistants for physicians is receiving a great deal of attention throughout the medical education community. The precedent was established in the U.S.S.R. with the development of the *feldsher*. Such assistance is perceived as one possible method for extending the services of a physician by enabling him to delegate duties which do not require his medical judgment. Examples are taking the medical history, doing preliminary examination of the patient prior to examination by a physician, and a host of similar duties. The first official mention of this approach came in President Johnson's message to Congress on America's Children and Youth, February 8, 1967. At that time he called for 10 pilot centers to study health care delivery techniques and to train various types of health workers.

Several pilot programs for training various types of assistants are underway. Students in these programs have varying education and experience backgrounds. Some have no previous experience in the health field. Others, such as discharged military medical corpsmen, have had specific training for health occupations.

The length of the training programs vary from a few months to 5 years. Some experimental programs do not lead to any academic degree, some lead to an associate degree, and several are designed to terminate with a bachelor's degree. The following designations differentiate the three levels of training:

Physician's associate applies to a person with a bachelor's degree or graduate education who has received specialized training in order to work with a physician in clinical or research endeavors. Such persons would be qualified to perform certain specified tasks that would contribute to diagnosis and treatment under the direction of physician-specialists. Examples of educational programs are the 4-year-degree courses in development at Duke University Medical Center (Durham, N.C.), University of Texas Medical Branch (Galveston, Tex.), and Alderson-Broaddus College and Hospital (Philippi, W. Va.). A Child Health Associate program is being developed at the University of Colorado Medical Center (Denver, Colo.).

Physician's assistant refers to a person who has completed a 2-year curriculum leading to the associate degree (with an additional 2 years of academic work, he would qualify for a baccalaureate in medical science and the designation of physician's associate). Duke University and the University of Texas Medical Branch plan to offer both degrees. An *orthopedic assistant* 2-year curriculum is being developed at the City College of San Francisco (San Francisco, Calif.).

Physician's aide describes a person whose period of formal training is less than 2 years beyond high school. The training to become an *obstetrical, pediatric,* or *surgical aide* is usually offered on the job by the medical specialist who seeks this type of individual.

Programs underway at eight institutions to prepare assistants for physicians are described on the following pages.

City College of San Francisco
Pacific Medical Center
San Francisco, Calif.

Title of program:

Development of Orthopedic Assistant Training and Certification Program.

Year initiated:

1968.

Curriculum description:

The curriculum is being developed on the basis of work completed under the Bureau of Health Manpower contract with Presbyterian Medical Center.[1]

The purpose is to develop a 2-year community college curriculum to train a new category of professional assistant for orthopedic surgeons. The assistant will be competent to assist in the operating room, cast room, emergency room, and office, as well as to assemble and maintain various types of orthopedic equipment.

The first stage of the project will be to conduct a detailed task analysis. This will be followed by the structuring of a curriculum.

Award:

An associate degree will be awarded to those who successfully complete the 2-year course.

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[1] A 2-year contract with the Public Health Service (Bureau of Health Manpower, Division of Allied Health Manpower) which was completed on June 19, 1968. Total amount of contract: $139,000.

University of Colorado Medical Center

Denver, Colo.

Title of program:

Child Health Associate.

Year initiated:

1968.

Curriculum description:

Two (or more) years of undergraduate study followed by a 2-year course of instruction at the University of Colorado Medical Center in Denver and a 1-year internship. Particular emphasis is placed on the 80 to 90 percent of pediatric practice which is concerned with well children and relatively mild disease states.

1. *Undergraduate—2 years.* Course of study similar to, but shorter than, that taken by premedical students.

2. *University of Colorado Medical Center—2 years.* First year: Basic science. Second year: Clinical experience on the pediatric wards, in nurseries, in the outpatient departments as well as in various community facilities including neighborhood health centers, special community residential centers, child health conferences, offices of private pediatricians.

3. *Internship—12 months.* A combination of services with emphasis on the experience in outpatient clinics, the offices of private pediatricians, and the community facilities and relatively little time on the wards.

Award:

On completion of the undergraduate curriculum and the 2-year training program at the medical center, the baccalaureate degree is awarded.

The Colorado State Legislature is considering a bill which, if passed, would authorize the Colorado State Board of Medical Examiners to license the Child Health Associate to diagnose and treat children under the direction of a board-qualified or board-certified pediatrician.

Emory University[1]

Atlanta, Ga.

Title of program:

A Study of Anesthesiology With Special Reference to Manpower Problems and Suggestions for the Development of New Types of Allied Health Personnel to Meet Manpower Needs.

Year initiated:

1968.

Curriculum description:

Curriculum development is planned to follow a study of manpower needs in the field of anesthesiology, a task analysis of the duties, functions, and responsibilities of personnel involved in rendering anesthesiology services, and the design and installation of patient monitoring equipment. Portions of these tasks will be accomplished in cooperation with the University of Florida, Gainesville, Fla.; Medical College of Georgia, Augusta, Ga.; and Space Instruments Research, Inc., Atlanta, Ga. Following the completion of these projects, the project directors, with the assistance of a panel of anesthesiologists, will propose further steps to determine the feasibility of developing a new type or types of anesthesiology personnel to assume some of the functions now limited to the anesthesiologist. The ultimate purpose is to seek ways of extending the services of the anesthesiologist and to formulate a more efficient method of delivering anesthesiology services.

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[1] This program is being carried out through a 1-year contract which is funded jointly by the Division of Allied Health Manpower and the Division of Physician Manpower in the Bureau of Health Professions Education and Manpower Training. National Institutes of Health. The cost of the contract is estimated at $69,366.

Purser-Pharmacist Mate School

Public Health Service Hospital

Staten Island, N.Y.

Title of program:

Purser-Pharmacist Mate Course.

Year initiated:

1966.

Curriculum description:

The purposes of this 9-month school are twofold; first to provide a well-rounded basic program through academic and practical experience which will enable the pharmacist mate in the merchant marine fleet to perform his tasks; and second, to establish a basic medical curriculum from which other paramedical courses will evolve.

Students are trained to meet medical emergencies, both medical and supportive, with knowledge and independent judgment.

The program consists of 660 instructional hours and 420 hours of practical experience.

A curriculum was developed in 10 areas, each with its own course outline and bibliography.

Award:

Each student receives a certificate as a trainee Purser-Pharmacist Mate. In addition, the U.S. Coast Guard gives recognition to the student as having met the standards necessary to qualify as a Purser-Pharmacist Mate and will so endorse his present license.

Duke University Medical Center

Durham, N.C.

Title of program:

Physician Assistant Program.

Year initiated:

1965.

Curriculum description:

The present Physician Assistant training program is based upon the concept of an "inverted curriculum." The approach taken provides four levels of training, each designed to determine the aptitude and capacity of the student to grasp and apply appropriate knowledge at levels of increasing complexity. The objective is the early elimination of those students who could not function effectively in a clinical setting. Structure of the training program follows:

1. *First level—3 months.* Measures capacity to grasp scientific principles, to learn and use medical terminology, and to master skills of measurement and quantitation.

2. *Second level—6 months.* Anatomy, physiology, pathophysiology, pharmacology, metabolism, concepts of disease, animal surgery.

3. *Third level—15 months.* Clinical training in history taking and physical diagnosis, use of equipment and instruments, diagnostic and therapeutic techniques in laboratories and clinical areas. (This phase would provide training for a generalist Physician Assistant and elective "specialist" Physician Assistant orientation.)

Upon completion of the third level (2 years), the student is awarded a Physician Assistant Certificate.

4. *Fourth level—2 years leading to a B.S. degree.* This provides ongoing opportunity for capable students who may elect to pursue education to the master or doctorate degree. It is intended that the combined 4 years (Physician Assistant certificate plus bachelor of science degree) would satisfy premedical requirements for admission to accredited medical schools.

Award:

Current: 2 years—Physician Assistant (P.A.) Certificate.
Planned: 4 years—Bachelor of science degree.

Bowman Gray School of Medicine

Division of Allied Health Sciences

Wake Forest University

Winston-Salem, N.C.

Title of program:

A Study to Evaluate Need and to Design Curricula and Methods of Training for Physician Assistants.

Year initiated:

1968.

Curriculum description:

This project includes a task analysis of several medical specialties such as general and family medicine, pediatrics, and general surgery. The purposes are to develop a basic general working definition of the Physician Assistant and to develop a core training program. This project is being supported by the Division of Physician Manpower, Bureau of Health Professions Education and Manpower Training, National Institutes of Health, in the amount of $53,458.

University of Texas Medical Branch
School of Medicine
Galveston, Tex.

Title of program:

Clinical Associate.

Year initiated:

1968.

Curriculum description:

In development; not yet available.

Award:

2 years—Associate degree.
4 years—Bachelor of science degree.

Alderson-Broaddus College and Hospital
Philippi, W. Va.

Title of program:

Physician's assistant program.

Year initiated:

1968.

Curriculum description:

This 4-year experimental curriculum has three successive parts.

1. Liberal arts and basic sciences education, designed to provide the student with continued capacity for growth in his later professional career.

2. Clinical procedure and technology, to provide competence in the principles of the management of patients and diagnostic equipment and testing. For example, electrocardiograms, urinalysis, and blood counts, as well as the fundamentals of X-ray diagnosis.

3. Clinical clerkship training, to equip students with an understanding of the disease process, chronic and acute, and the doctor's decisions concerning them. During this period the student would learn how to take histories of patients, conduct physical examinations, and detect abnormal signs and symptoms.

Award:

Bachelor of science in medical science.

Appendix F

Manpower Needs in Relation to Alcoholism

Appendix F

Manpower Needs in Relation to Alcoholism[1]

Recent years have seen an increasing awareness of both the magnitude of alcoholism and the neglect of this major problem area. There now is a realization of the immense impact of drinking problems on the health and well-being of millions of Americans and their families. Recent years also have been marked by a substantial change in public and professional attitudes toward alcoholism. Finally, strenuous efforts are underway in many parts of the country to find humane and more satisfactory ways of dealing with chronic alcoholics than the present "revolving door" system.

One of the most urgent needs in relation to coping more effectively with alcoholism is the overcoming of the acute shortage of trained personnel. This shortage has persisted because of the belief that alcoholism was not an illness and the myth that alcoholics could not be helped. Manpower needs can be divided into three principal areas: (1) the training of professional workers in fields such as medicine, nursing, social work, etc.; (2) the training of nonprofessional and semiprofessional alcoholism counselors; and (3) the training of a small number of specialists in areas such as research, administration, and teaching.

The bulk of training of personnel in relation to alcoholism should be provided by the professional schools. Most assistance for alcoholics will need to be given by personnel from the basic health and other helping professions. Information on the treatment and medical management of alcoholism should be included at several levels of medical training—classroom instruction, clerkship, internship, and residency training programs. This learning should occur in settings which do not perpetuate the attitudes of revulsion and therapeutic pessimism toward alcoholics that now characterize the educational experience of virtually all medical students. Psychiatric training should not be restricted to the provision of detoxification care in emergency services and should include supervised psychotherapeutic work with alcoholics and their families. Social work training should include both classroom work and practical field experience with clients who are problem drinkers. This can be either in a general, social, or psychiatric agency that provides assistance to these patients, or in a specialized alcoholism treatment facility.

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[1] Prepared by the National Center for the Prevention and Control of Alcoholism, National Institute of Mental Health, Health Services and Mental Health Administration, Public Health Service, U.S. Department of Health, Education, and Welfare.

Programs of continuing education, extension education, and postgraduate training in the fields of medicine, psychology, social work, nursing, corrections, and psychiatry should include appropriate attention to alcoholism. There also is a need for inclusion of material on alcoholism in the training of clergymen and police officials. Currently, very few teachers are qualified to be effective in relation to preventive alcohol education.

The training of mental health personnel such as psychiatrists, psychologists, social workers, and psychiatric nurses is particularly important because community mental health centers are increasingly serving as key resources for the treatment of alcoholics and their families. By 1975, over 2,000 such centers will be in operation throughout the country.

While there is a major shortage of qualified personnel to provide treatment to alcoholics, there is also a severe shortage of other workers in areas such as education, community organization, and consultation. Such persons, functioning, for example as consultants, coordinators, and "catalysts", would be familiar with many aspects of alcoholism and also with general trends in the fields of health and social welfare. Their educational background should include work in psychology and sociology, and in addition, they should have special training and experience in such areas as community organization and group dynamics.

The better utilization of semi- and non-professional workers is all the more urgent because of the continuing shortage of trained personnel in all the helping professions. There has been a tradition of using nonprofessional personnel, particularly recovered alcoholics, in many facilities. These workers can function most effectively if they have had some previous training. Such training should include: (1) orientation to professional approaches to alcoholism, (2) knowledge about different agencies and their functions, (3) supervised field experience, (4) emphasis on the importance of assessing each patient's needs, and (5) recognition of the potentialities and limitations of nonprofessional workers.

During an interim period—say 5 to 10 years—substantial assistance will have to be provided to medical schools, schools of nursing, schools of social work, and other training institutions to help them overcome this long standing neglect of alcoholism. Hopefully, at the end of such a period, training in relation to this major medical-social problem, will be an integral part of the training of all health and other "helping" professional personnel.

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